AGRICULTURE
IN RHODE ISLAND

by

Holrick J. Miller

Member of the Statistical Staff
of the State Planning Board

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RHODE ISLAND
STATE PLANNING BOARD
SPECIAL REPORT NO. 12
JUNE 25, 1937

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by

Holrick J. Miller

Member of the Statistical Staff
of the State Planning Board

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R H O D E I S L A N D
S T A T E P L A N N I N G B O A R D

SPECIAL REPORT NO. 12

JUNE 25, 1937

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PART I
PHYSICAL CHARACTERISTICS OF RHODE ISLAND

A. GEOGRAPHIC POSITION AND AREA

The geographic position and area of a state are basic factors ultimately determining the nature and extent of its agricultural production.

The State of Rhode Island is situated on the north Atlantic coast of the United States and, including its most southerly island territory of Block Island, which lies about ten miles off the coast in the Atlantic Ocean, together with those Atlantic waters extending one marine league from all territorial shores, the State extends from a geographic centre approximately at North Latitude 41°-38'-35" West Longitude 71°-31'-35" to a somewhat rectangular outline of land included between the lines of its outermost land points at the parallels of North Latitude 41°-08'-48" and 42°-01'-09" and at the meridians of West Longitude 71°-07'-15" and 71°-53'-30".

The total area under jurisdiction of the State is 1,497.39 square miles, of which 1,084 square miles are land area, including that of Block Island, and 413.39 square miles are tidewater area including that part of the Atlantic Ocean extending one marine league from all territorial shores.

B. CLIMATE OF THE STATE

Favorable climatic factors are essential to a good agri-

cultural harvest, which varies in quality and abundance with the amount of sunshine and rainfall and with the prevalence of the warm temperatures that characterize the growing season.

1. GROWING SEASON

Rhode Island lies within the North Temperate zone and the climate in general is seasonally mild with much variation in weather conditions, favoring agricultural production throughout a growing season which extends four months from late May to late September in the higher interior of the State to the central-west and north-west, and widens to an extension of six months from late April to late October in the lower areas to the east and south of the State including Block Island.

The length of the growing season in the State is shown graphically in Chart I.

2. MONTHLY TEMPERATURES

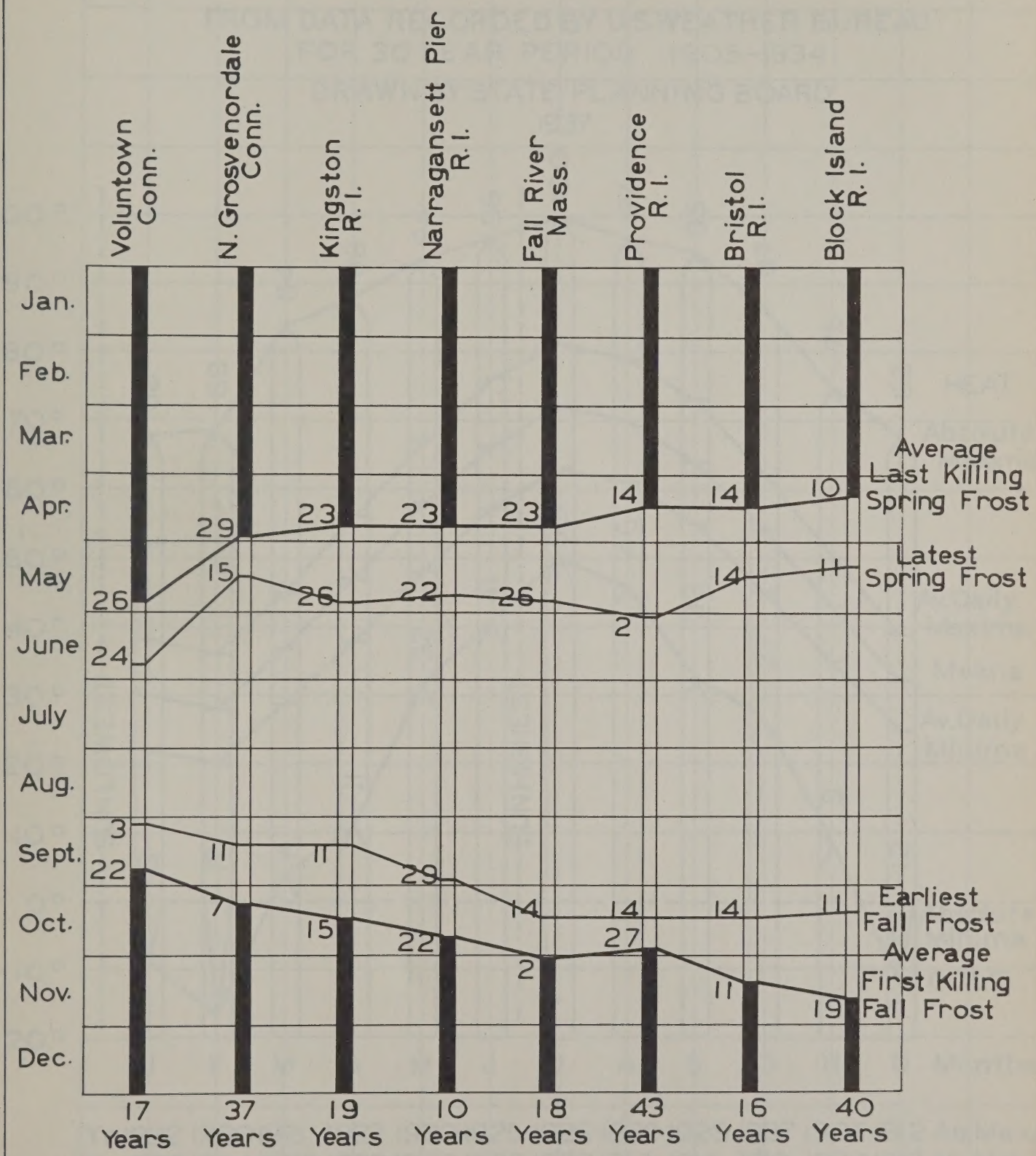
The cold extremes in the higher interior of the State may register several degrees lower in temperature than in the coastal lowlands because here the tempering influence of the Atlantic salt waters is more pronounced; but the area of the State is so small that the average temperatures recorded for Providence, especially those recorded during the growing season, may serve for purposes of agricultural discussion as the average for the State of Rhode Island.

The average and extreme monthly temperatures at the city of Providence covering the 30-year period from 1905 to 1934, are shown graphically in Chart II, from data recorded by the United States Weather Bureau.

LENGTH OF GROWING SEASON

KILLING FROSTS IN RHODE ISLAND AND VICINITY

(COPY OF PLATE III "THE WATER RESOURCES OF R.I." 1928 BY PROF. CHARLES W. BROWN)



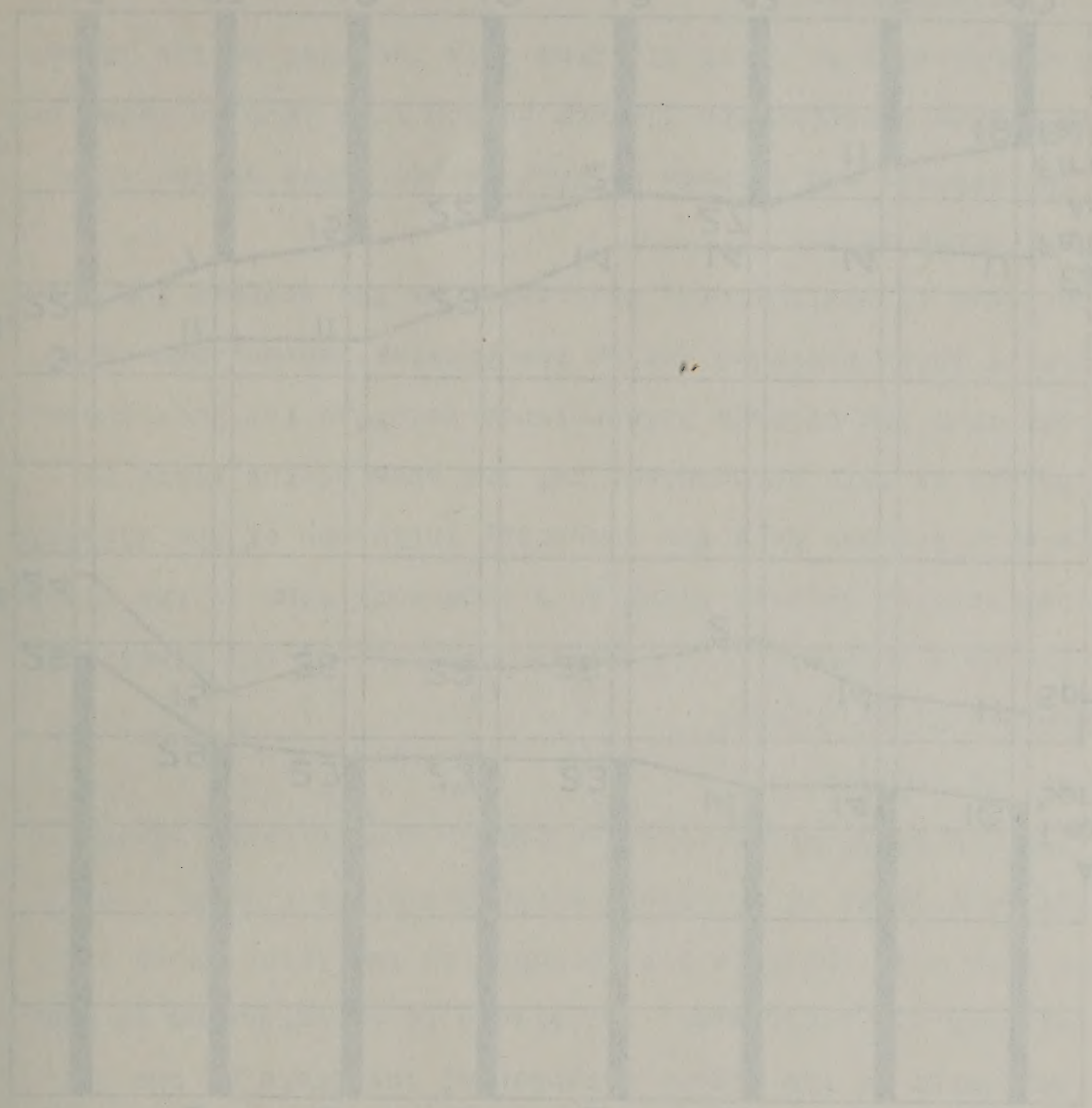
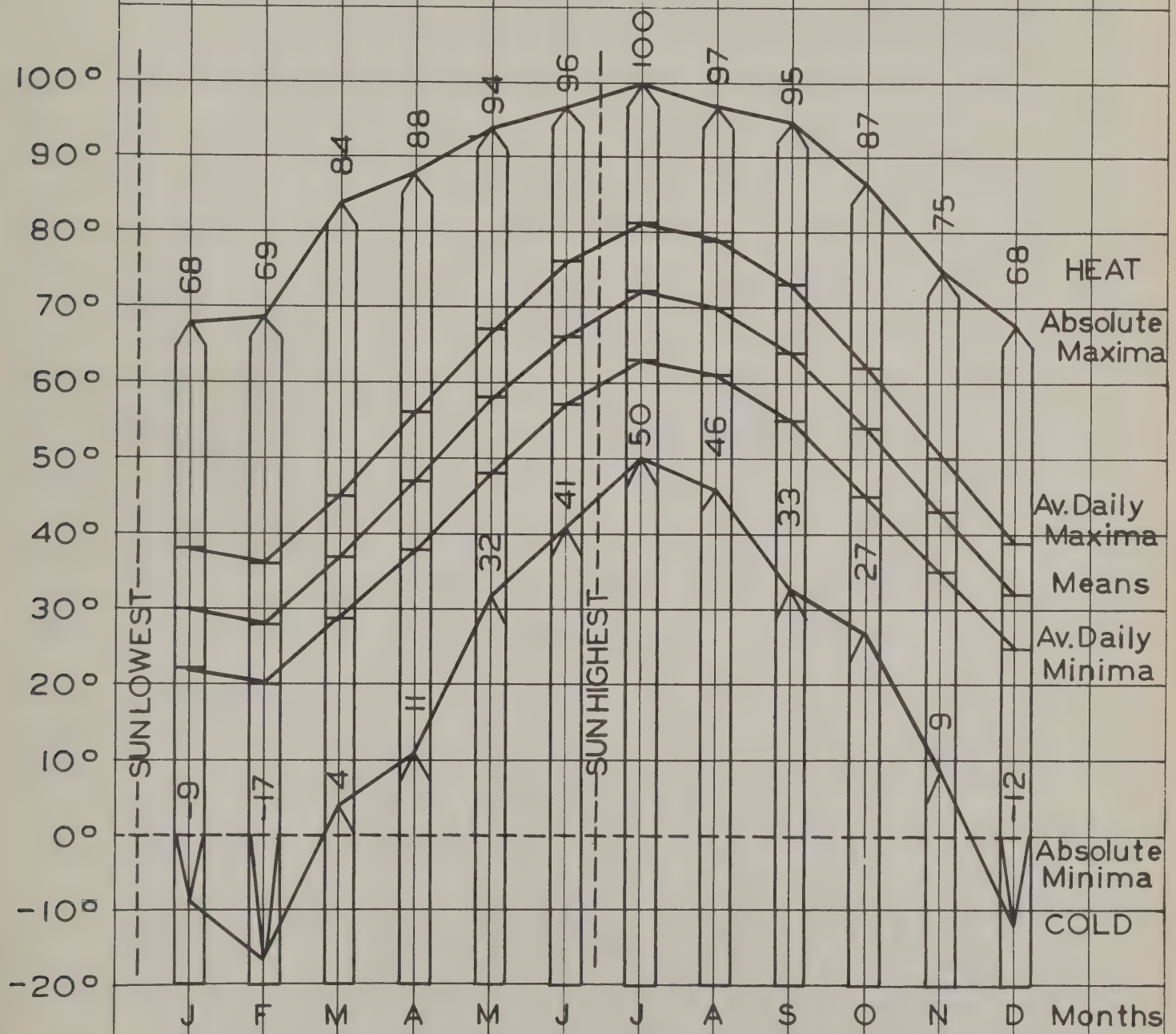


CHART II

EXTREMES AND MEANS OF MONTHLY TEMPERATURES
PROVIDENCE, R.I.

FROM DATA RECORDED BY U.S. WEATHER BUREAU
FOR 30 YEAR PERIOD 1905–1934

DRAWN BY STATE PLANNING BOARD
1937



Yr.	1932	1930	1921	1927	1930	1925	1926	1930	1929	1927	1909	1912	Ab. Max.
Yr.	1907	1934	1923	1923	1907	1932	1927	1912	1914	1910	1932	1917	Ab. Min.

An analysis of the chart shows that July is the hottest month and February the coldest, and that the hottest and coldest temperatures respectively occur about a month after the sun has attained its highest and lowest positions, and that temperatures below zero occur at Providence only in the months of December, January and February.

The chart also shows that the average daily low and high temperatures each have a fairly constant monthly rise of approximately 9° each month from an average low point of 20° in February to an average high point of 81° in July, with a like subsequent fall in temperatures from July to February, and with a fairly consistent range between the average low and average high temperatures of each month throughout the year, showing a range of approximately 18° from the average low to the average high temperatures for each month of the growing season.

Analyses of the additional statistical data on climatic conditions recorded by the United States Weather Bureau at Providence, covering this same 30-year period, have disclosed the weather facts stated in the following paragraphs.

3. AVERAGE SNOWFALL

Traces of snowfall have been recorded as late as May and as early as October, but snowfall in Rhode Island is extremely rare in these two months which limit the growing season, and average monthly snowfall of more than one inch is generally confined to the four monthly periods of December to March.

For the 30-year period under consideration, the greatest average monthly snowfall of 10.3 inches occurs in February; the greatest snowfall in 24 hours, which was recorded as 14.1 inches in 1921, also occurred in the month of February; and the average

yearly precipitation of snow is 31.4 inches.

4. PREVAILING WINDS

Destructive winds of high velocity are of unusual occurrence in Rhode Island and come mostly from the northwest with a mean highest velocity of 54 miles per hour; and the absolute highest velocity was recorded as 63 miles per hour for a west wind in December of 1916.

In general the winds are favorable to agricultural production, for throughout the year the prevailing winds in Rhode Island blow gently from the northwest with an average velocity of 11.7 miles per hour; while frequent winds blowing mildly from off the coast bring moisture and the seasonally tempering influence of the Atlantic salt waters so that excessive cold periods, and excessive heat and drought periods, are infrequent and usually of short duration.

5. SUNSHINE AND FOG

In no month of the year do the hours of sunshine record less than 50% of all such possible hours, and throughout the growing season Rhode Island receives each month better than 60% of all possible hours of sunshine, which thus greatly favors agricultural production.

Dense fogs are of rare occurrence and are not more than an average of one day duration in any month of the year in Rhode Island, and none are recorded during the agricultural months of June, July, and August.

6. AVERAGE RAINFALL

The State, on an average of 10 days each month, has precipitation varying from a trace to larger amounts. The least monthly precipitation officially recorded at Providence is 0.07

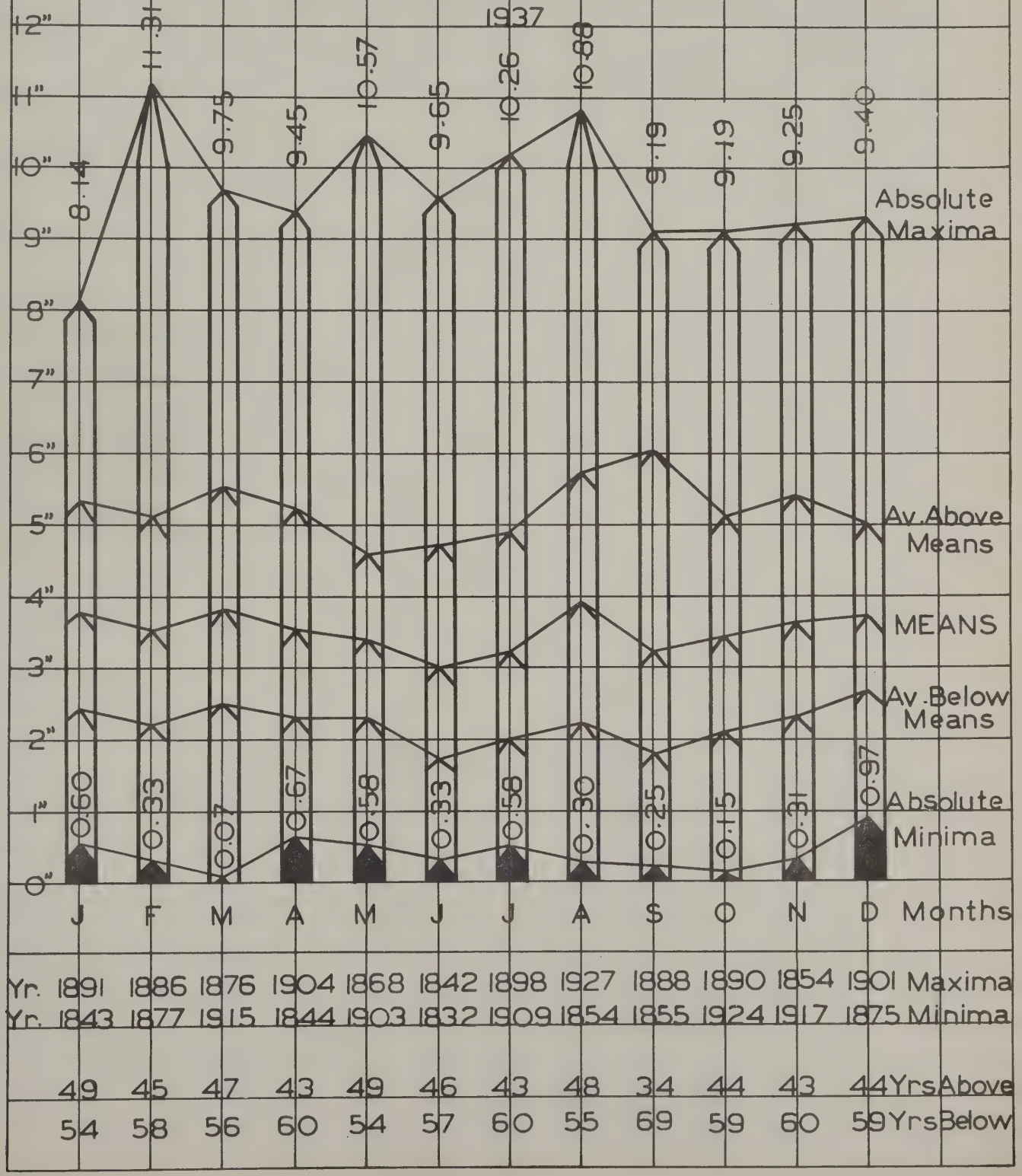
Chart III

Extremes And Means Of Monthly Precipitation
Providence, R. I.

From Data Recorded For 103 Years 1832-1934

1832-1876 By Brown University 1877-1904 By City Engineer
1905-1934 By U. S. Weather Bureau

Drawn By State Planning Board
1937



	J	F	M	A	M	J	J	A	S	O	N	D	
Yr.	1891	1886	1876	1904	1868	1842	1898	1927	1888	1890	1854	1901	Maxima
Yr.	1843	1877	1915	1844	1903	1832	1909	1854	1855	1924	1917	1875	Minima
	49	45	47	43	49	46	43	48	34	44	43	44	Yrs Above
	54	58	56	60	54	57	60	55	69	59	60	59	Yrs Below

of an inch for March, 1915. The greatest monthly precipitation is 11.31 inches, recorded for February, 1886. The greatest precipitation in 24 hours is 6.17 inches, recorded in September, 1932.

The average and extreme monthly precipitation at the city of Providence covering the period of 103 years from 1832 to 1934 is shown graphically in Chart III, from data recorded by three reliable agencies of which one is the United States Weather Bureau.

It may be observed on the chart that the mean monthly precipitation is close to 3.5 inches, varying but slightly from month to month and within limits of one-half inch throughout the year; and also that the average precipitation is pretty evenly divided in the number of years above and below the means over the period of 103 years , showing a fairly consistent range from approximately 2 to 5 inches of rainfall each month of the growing season.

The area of the State is so small that the average precipitation recorded for Providence may be considered also as the average for the State of Rhode Island.

C. GEOLOGY AND TOPOGRAPHY

The uncontrollable and ultimately underlying geologic and topographic factors primarily determine the basic composition and fertility of farm soils and the feasible extent of individual farm lands and so have a remotely indirect but nevertheless appreciable influence upon present day farms and farming in Rhode Island.

Some few facts gleaned from authoritative sources and pertinent to soil derivation and to size of farm holdings are presented respecting these two basic and practically unchangeable factors of geology and topography before discussing the somewhat controllable and more variable factors of top soils and agricultural products in present day farming in the State.

1. GEOLOGIC BEDROCKS

The main geologic bedrock areas of Rhode Island practically coincide with the three main topographic divisions of the State as shown on Map A.

In a field survey report entitled "The Water Resources of Rhode Island" prepared in 1928 by Professor Charles Wilson Brown, Professor of Geology at Brown University, the facts given concerning the bedrock geology of the State are in substance as follows:

Bedrock geology divides the State into three main areas wherein the predominant rock formations are respectively granite, sandstone or conglomerate, and shale.

The western two-thirds section of the State, beginning beyond the coastal lowlands at a variable distance nowhere greater than 5 miles from the shoreline west of Narragansett Bay and north of the Atlantic Ocean, is an area of hilly uplands underlain by more or less ancient crystalline rocks -- granites, gneisses, and schists -- that have stood more strongly against the eroding surface agencies.

The eastern one-third section of the State is underlain by weaker sedimentary rocks -- sandstones, conglomerates, and shales -- that have withstood the natural wearing-down processes

with varying degrees of resistance and thus have furnished the coastal area of sand-plain lowlands in and about Narragansett Bay and adjoining the Atlantic Ocean, and the more easterly area of gently rolling uplands between the Bay and the Massachusetts line.

These two distinct physiographic sections are readily recognized in field survey as topographically delineated by the rise of the stronger crystalline hills, which rise abruptly to some 200 feet between East Greenwich and the western part of Providence and thence northeasterly to the State line.

2. TOPOGRAPHIC DIVISIONS

The general topography of the State is shown on Map A.

The three main topographic divisions, which coincide almost identically with the areas of the three main geologic bedrock formations, are characterized in "The Water Resources of Rhode Island" substantially as follows:

(a) The coastal sand-plain lowlands -

The coastal sand-plain lowlands in and about Narragansett Bay and adjoining the Atlantic Ocean, form one distinct topographic division. Here bedrock may be two hundred feet below sea level; and the surface carbonaceous and graphitic shales offer little resistance to erosion, especially glacial scour. These areas when thus eroded were later washed by heavy glacial deposits forming the sand-plains about Narragansett Bay, to the east and west of which rise low, glacially-rounded rock hills.

(b) The eastern rolling uplands -

Eastwardly and northerly of upper Narragansett Bay is a second topographic division, which consists of slightly higher

but gently rolling uplands rising gradually toward the Massachusetts line. These uplands owe their elevation to the predominance of coarse sandstone and conglomerate rock formations that withstand the erosion of weathering, river, and ice work to a greater degree than the weaker shales in the coastal lowlands.

(c) The western hilly uplands -

The larger topographic division comprises the western two-thirds of the State, and consists of much higher and hilly uplands that owe their elevation to the stronger crystalline rock formations which are mostly granite. These hilly uplands rise gradually northwesterly -- after the abrupt rise of 200 feet just west of Providence -- to a maximum of 805 feet at Durfee Hill in Glocester. This eminence, however, is not much above a southeasterly-dipping plateau of from 600 to 700 feet elevation. Throughout this plateau region glacially - rounded elevations and long ridgy hills predominate. Their glacially - smoothed and easy north slopes contrast strongly with their glaceally - plucked and steeper south faces, and the western slopes appear to be somewhat steeper than the eastern slopes.

D. SOILS OF THE STATE

The nature and stability of the top soils determine directly the feasibility and profit of agricultural enterprise, and thus the features of soil fertility and soil erosion are matters of vital concern to the welfare of the agricultural industry.

MAP OF THE STATE OF RHODE ISLAND SHOWING GENERAL TOPOGRAPHY

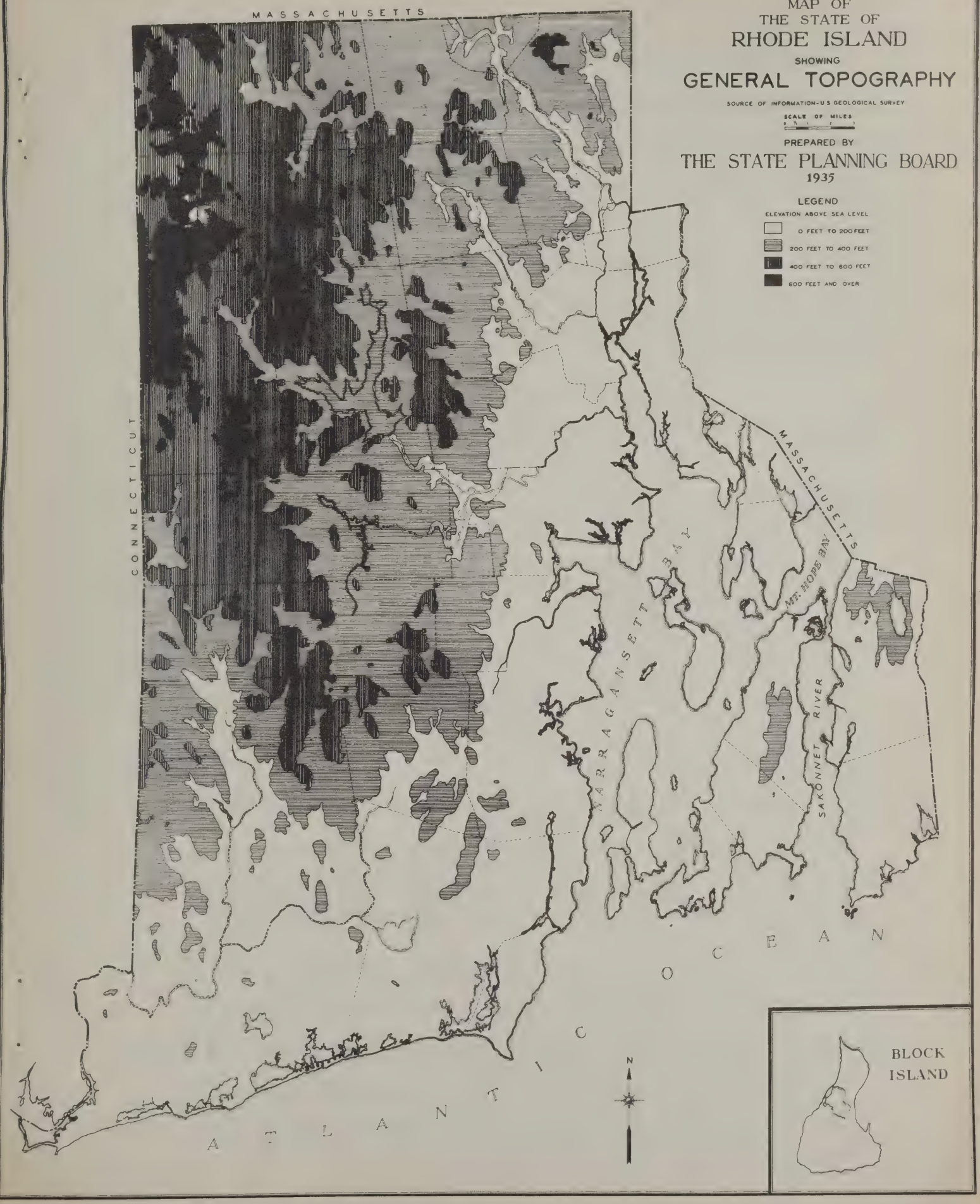
SOURCE OF INFORMATION-U.S. GEOLOGICAL SURVEY

SCALE OF MILES

PREPARED BY

THE STATE PLANNING BOARD

1935



1. ORIGIN AND TYPES OF SOILS

Though in small part the result of residual weathering, nearly all the soils of Rhode Island are revealed by official survey to be mainly of glacial origin, the total acreage being about equally the result of glacial erosion and glacial deposit.

In the Soil Survey of Rhode Island conducted in 1904 by the United States Department of Agriculture, eleven soil types were reported in the State as shown in the following Table 1.

Table 1

Type, Origin, Extent, and Depth of Rhode Island Soils

Type of soil	Main origin	No. of acres†	% of total	Average depth in inches
Glocester stony loam	Glacial erosion	324,818	46.82	10
Miami stony loam	" deposit	149,783	21.59	10
Warwick sandy loam	" "	82,766	11.93	10
Alton stony loam	" "	69,862	10.07	8
Swamp	-- --	26,987	3.89	--
Norfolk coarse sand	Glacial deposit	26,293	3.79	6
Miami silt loam	" "	4,926	.71	10
Galveston sandy loam	Mixed origin	4,232	.61	10
Galveston fine sand	Marine deposit	2,012	.29	12
Meadow	-- --	1,942	.28	--
Dunesand	-- --	139	.02	36
Total acreage of State		693,760*	100.0%	

† Survey figures revised relative to official total acreage of State.
* Official total of State Planning Board - Survey total is 694,400 acres.

2. FERTILITY AND DISTRIBUTION OF SOILS

It may be observed from the table of state soils given above that the deeper and more weathered and richer alluvial soils of river origin are noticeably lacking in the State and thus the soils of Rhode Island are seen to be relatively

thin, more coarse and sandy, and less fertile; having an average depth of about 10 inches, and consisting principally of stony and sandy loams, and possessing in varying degrees the agricultural characteristic of fertility.

In the soil fertility ratings of this 1904 survey report, only the Alton and Miami soils were rated as naturally productive, while the Warwick soil was rated as productive with fertilizers. The Gloucester soil was rated as generally unproductive, and the remaining soils were classified either as naturally unproductive or unsuited to agriculture.

The most extensive soil is the Gloucester stony loam, which covers about 45% of the state's land area and predominates throughout the western two-thirds of the state; while the Miami stony loam is the next most extensive soil type, which makes up about 20% of the total land area and is predominant in the eastern one-third of the State.

However the line of stronger crystalline hills forming a boundary between these two distinctly different physiographic sections of the state, served as no absolute barrier to the distributive agency of glacial action, which so throughly scoured the entire land surface of Rhode Island that the different soil types were thus deposited or distributed in variously sized areas intermingled throughout the State.

The different types of loam soils, as they occur in the five counties of the state, and in order of their greatest extent, as shown on the map of soil distribution accompanying this 1904 Soil Survey report, are given in the following

Table 2, together with a more recent fertility rating of soils contained in a report on the State Survey of Agricultural, Industrial, Social, and Housing Conditions in Rhode Island made by the Planning Division of the Resettlement Administration in 1935, in which report the soils are rated in total by counties on a basis of farmland fertility as follows (highest rating 50):

Table 2

Distribution and Fertility of Rhode Island Soils by Counties

County	Relative distribution of loam soils in order of greatest extent	Fertility rating of county soils in total
Newport	Miami - Glocester - Alton	50 (Rich farmland)
Bristol	Miami - Warwick	50 (" ")
Providence	Glocester - Miami - Warwick	45 (Fertile ")
Kent	Glocester - Alton - Warwick	45 (" ")
Washington	Glocester - Miami - Alton	25 (Medium ")

The fertility rating of county soils given by the Resettlement Administration and as shown in Table 2 appears not to conform, in respect to all counties, with such fertility rating implied by the extent of productive soil types in counties, as shown in Table 2 and given on the map of soil distribution in this 1904 soil survey report of the Department of Agriculture.

A more comprehensive soil survey of the State is now underway by Rhode Island State College in co-operation with the United States Department of Agriculture.

3. SOIL EROSION AND AREAS AFFECTED

Soil erosion is neither extensive nor severe in Rhode Island, as disclosed by a reconnaissance erosion survey made in 1934 by the United States Department of Agriculture.

Moderate wind erosion was found to affect only 19,529 acres or 2.7% of the State's land area, mostly along the coastal regions in Washington and Kent counties and principally within an area of about 5 miles square centering at Hillsgrove in the city of Warwick, Kent county.

Moderate water erosion, mainly sheet erosion with occasional gullying, was found to affect only 20,726 acres or 2.9% of the State's land area. This water erosion is effective in small areas scattered throughout the State and occurs on clean-tilled areas of moderate slope where no effort is made to cultivate along the contour.

The areas affected by erosion are tabulated as follows:

Wind erosion

About 5 miles square, centering at Hillsgrove in the city of Warwick.

Water erosion

(a) Both sides of the Wood and Flat Rivers, northerly from Hope Valley, 7½ miles long and from 1 to 1½ miles in width, in the towns of Hopkinton, Richmond, Exeter and West Greenwich.

(b) About 5 square miles adjacent to Wickford Harbor and Belleville Pond in the towns of North Kingstown.

(c) About 2 square miles along the Nooseneck River in West Greenwich.

(d) About 5 square miles around Tiogue Pond in Coventry.

(e) About 5 miles on both sides of the Pawtuxet River in Cranston and Warwick, with a maximum width of about 2 miles at Pontiac.

(f) About 3 square miles in the towns of Scituate and Johnston, adjacent to Moswansicut Pond.

PART II
CONSERVATION AND LAND USE

A. LAND AND FOREST CONSERVATION

The kind and amount of future agricultural production is determined for a given territory to a considerable extent by present long-term planning for best utilization of land in general and particularly of land in agriculture.

Such planning includes measures that press for soil conservation by preserving and increasing the stability and fertility of soils, and includes measures that press for conservation of natural water resources, particularly through reservation and reforestation of extensive areas and through protection of forested areas against fire.

1. SOIL CONSERVATION

The stability of Rhode Island's soil is little affected by water or wind erosion, and there is no official program in the State directly combatting such soil erosion.

The United States Department of Agriculture is cooperating with Rhode Island farmers to conserve and increase the fertility of soils in the State, by administering a definite program of soil conservation that provides benefit payments to farmers participating in one or more of the nine effective soil-building practices of the program enumerated as follows:

Soil-Building Practices

1. Liming cropland and pasture.
2. Using superphosphate or basic slag with soil-conserving crops.
3. Using muriate of potash with soil-conserving crops.
4. Using nitrate of soda with soil-conserving crops.
5. Seeding clover.
6. Seeding alfalfa.
7. Growing small grains or annual grasses as green-manure crops.
8. Growing legumes as green-manure crops.
9. Mulching orchards.

This Soil Conservation and Agricultural Adjustment Program was inaugurated in 1936, and is administered in Rhode Island under the direction of G. E. Adams, Director of Rhode Island State Extension Service, as administrative officer, with R. S. Shaw, of the State Extension Service, as executive officer. Mr. Shaw has stated that a total of $8,868.06 in benefit payments was distributed to the 142 Rhode Island farmers participating in this program during 1936. A total of 741 farmers in the State were enrolled on May 25, to take part in the program for the year 1937.

The comprehensive soil survey now underway in the State, which is being conducted cooperatively by the Bureau of Soils of the United States Department of Agriculture and the Agricultural Experiment Station of the Rhode Island State College, the field work of which will probably be completed during the present year, together with the associated soil cover studies being conducted by the Rhode Island Agricultural Experiement Station, will furnish much valuable background material upon which to base future soil conservation programs within the State.

The last previous official soil survey of Rhode Island was conducted in 1904 and a report thereon printed in 1905 by the United States Department of Agriculture.

2. RESERVE AREAS

The Federal Government of late years has been pursuing throughout the western section of Rhode Island a policy of acquiring sub-marginal and wilderness lands of forest growth and natural scenery contiguous and interlocking with other such lands already owned or being acquired by the State for eventual consolidation of all such acquired lands as State-owned reserve areas for forest conservation and for recreational purposes.

The total of such areas at present acquired by the Federal Government and held by option or purchase, is 14,459.80 acres; and the total State holdings of 7,742.98 acres make up the present system of State-owned forests, parks and parkways, which system includes the only two forests now owned by the State - the George Washington Memorial Forest in Glocester and the Wickaboxet State Forest in West Greenwich, with areas respectively of 244 acres and 288 acres.

The Second Annual Report of the State Planning Board for the year 1936 contains a detailed exposition of the public areas in Rhode Island at present owned or under option by the Federal Government and the State, shows that 10,544 acres of the Federal lands and that 5,684.65 acres of the State-owned lands are forested wilderness areas devoted principally to conservation of wild life and forest growth.

3. REFORESTATION

Rhode Island's official program of reforestation activities is under the direction and supervision of the State Division of Forests, Parks and Parkways. A State nursery is maintained by

that Division at Pawtuxet River Reservation. This nursery, as of January 1, 1937, was growing one-year seedlings of 418,800 softwood trees, mostly pines, and 22,835 hardwood trees; also 78,900 transplants of 2-to 5-year old trees, all for subsequent planting on State reservations.

In addition to its own annual reforestation work on State-owned reservations, the Division of Forests, Parks and Parkways, as authorized by law since 1928, conducts an annual reforestation campaign to secure actual reforestation on other public and private-owned idle acres. For this purpose the Division acts as a service agency for information and advice on tree planting, and also for pooling and placing the orders of private individuals and corporations with reliable forest nurseries, thus aiding the individual landowner and farmer to obtain good quality tree stock at reasonable prices and for successful planting.

A total of 615,000 tree seedlings and transplants were purchased through this Division by individuals for planting on private-owned lands throughout the State during 1935; and for the same year the Division purchased for the State 160,000 tree seedlings and set them in the State nursery for later planting on State Reservations. In 1936 such purchases by the State totalled 116,000 seedlings, and individuals purchased 6,150 seedling trees in 1936 for planting on private-owned lands.

For the seven year period from 1930-1936 the records of the State Department of Agriculture show total plantings throughout the State of 28,830 hardwood trees and 3,762,700

softwood trees mostly pines, of which latter total the City of Providence planted approximately 2,000,000 such trees in 1934 on its watershed around the Scituate Reservoir.

Each town and city in the State, under provision of the State General Laws, appoints annually a Tree Warden subject to approval by the Division of Forests, Parks and Parkways, who functions in cooperation with the Forestry Section of this Division. The Tree Warden assumes the care and protection of shade and forest trees in his area, and he is authorized to develop a program of tree planting. Insufficient appropriations for this purpose have prevented extensive tree plantings by the Tree Wardens.

Considerable reforestation and other forest conservation work in the State is carried on by the Civilian Conservation Corps.

The Rhode Island state enrollment of the Civilian Conservation Corps is now approximately 1,200 members, and the Corps is maintained by the Federal Government in one state-leased and five state-owned CCC Camps on forested areas in various locations throughout the western half of Rhode Island.

In 1936 two of these CCC Camps were under the jurisdiction of the National Park Service and four of them were under the United States Forest Service.

The activities of the Corps are directed primarily on emergency work projects of forest conservation which include the general improvement and fire protection of forested areas and the reforestation of sparsely wooded and idle lands. This general

forest conservation work is performed on both public and private woodland and forest areas throughout the State, and such work is supervised by the Division of Forests, Parks and Parkways cooperatively with the Federal Services concerned.

As a part of the total tree plantings from 1930-1936 before stated, the Civilian Conservation Corps planted in 1934 a total of 137,000 pine trees and in 1935 a total of 118,000 pine trees; all purchased by the Federal Government and planted on state reservations. During the four-year period from 1933-1936, as a part of its land and forest conservation activities relative to reforestation, the CCC has improved in the State a total of 1377.30 acres of forest growth by cleaning, pruning, and thinning. Also during the same period the CCC has scouted and rescouted much of the forest areas in the State covering yearly for combined purposes an approximate average of 245,000 acres per year variously scouted for diseases and insects injurious to forest growth.

4. FOREST FIRE PROTECTION

In the realization that the safeguarding of forest areas against the destruction of forest fire is a basic factor of land and forest conservation, it affords no digression from the purpose of a comprehensive report on agriculture to present some pertinent facts and to outline the system existing in Rhode Island for suppression of forest fires.

Forest fires not only kill or injure extensive stands of forest growth that have a considerable commercial value in addition to their agricultural value in ameliorating the climate

and protecting the water resources, but such fires also cause further agricultural loss by burning the litter and humus upon which the soil depends for richness and moisture, in many instances heating and hardening the ground so as to reduce for years to come the productive capacity of the soil in large areas.

Including inland water areas, the total land area of Rhode Island is 693,760 acres, as officially established in 1936 by the State Planning Board. In a field survey of forest areas in Rhode Island conducted by the Division of Forests, Parks and Parkways in 1936, it was established that the total area needing protection from forest fire is 480,000 acres, of which the total forest area of the State is reported by the Division to be 417,328 acres, or 60% of the State's total land area. Yet the State has no large single stretches of primeval forest or majestic timber lands, and the forest growth of Rhode Island in total shows a general inferiority due in no small part to the severe burning suffered in numerous annual forest fires.

The extent of forest fires in Rhode Island from 1930 to 1936, inclusive, is shown in the following table.

Year	Number of Fires	Acres Burned	Prevention Expenditures	Suppression Expenditures	Damages	Total Fire Costs
1930	470	37,400	$ 6,678	$ 6,348	$327,560	$340,586
1931	360	9,380	5,230	4,112	58,989	68,331
1932	422	4,770	6,099	12,192	27,516	45,807
1933	159	1,747	6,503	4,190	10,773	21,466
1934	216	3,673	7,045	6,211	17,903	31,159
1935	253	5,471	8,905	9,435	29,677	48,017
1936	237	2,840	6,227	6,701	10,681	23,609
Total	2,117	65,281	46,687	49,189	483,099	578,975

For this seven-year period from 1930-1936 the forest fire record in Rhode Island shows that a total of 2,117 fires burned a total of 65,281 acres, with total fire costs (prevention plus suppression plus damages) aggregating $578,975.

These figures emphasize the State's need of forest fire protection.

March 20th to May 21st is the most hazardous period for forest fires in Rhode Island and 82.10% of the burnt areas and 72.84% of the forest fires occur during this two-month period, as shown by the forest fire statistics for the 3-year period of 1933-1935 in a comprehensive and detailed report on the Forest Fire Problem of Rhode Island by Crosby A. Hoar, Regional Inspector for the United States Forest Service, as reported in October 1936.

The State Fire laws require personal supervision by a Forest Warden of all fires in the open air set during April and May, as well as permits from such an official for the setting of such fires.

The facilities for forest fire suppression consist principally of forest truck trails, fire lanes, water holes, telephone lines, and observation towers.

The bulk of the man power in the Rhode Island units of the Civilian Conservation Corps is employed on work projects of forest fire protection, and during the four-year period from 1933 to 1936 that agency has constructed, on both public and private forested areas throughout Rhode Island, the following facilities for forest fire suppression: 221.7 miles of truck

trails; 69 miles of fire lanes; 527 water holes; 10.3 miles of telephone lines; and four of the nine State-owned forest fire observation towers.

The major items of equipment for forest fire suppression are trucks fitted with tanks and/ or pumps; plows; knapsack pumps; and ordinary hand tools such as axes, shovels, rakes and beaters. The knapsack pump is reported to be the most important item of such equipment, as brought out in Mr. Hoar's report of October 1936.

The State-owned equipment for forest fire suppression, available for use during period of forest fire hazard, is kept at numerous locations throughout the State; and in October of 1936 this equipment in total was recorded as consisting of 16 pump-or tank-trucks of variable description and efficiency for suppression of forest fires; about 146 knapsack pumps, and an undetermined number of hand tools, both of these items distributed around the State at the 11 State Police Barracks and at various State Reservations; and some additional and variable hand equipment at each of the six CCC Camps, part of which equipment is owned by the State and part owned by the Federal Government.

This State-owned equipment for forest fire suppression is supplemental to an undetermined but probably fairly adequate total amount of town-owned equipment in each of the various municipalities in the State, and to whatever equipment is owned by volunteer fire companies and by individuals.

The trained State personnel for forest fire suppression in Rhode Island numbers some 250 members who are organized as follows:

The Director of the State Department of Agriculture and Conservation is appointed biennially by the Governor subject to approval by the State Senate, and such Director by Rhode Island law is placed in nominal charge of the forest fire protection system existing in the State, which system is administered by his personally appointed Chief of the State Division of Forests, Parks and Parkways.

Such Division Chief personally appoints for forest fire service under him the 3 State District Forest Wardens, the 9 State Lookout Tower Observers, and one State Forest Ranger. A second State Forest Ranger is available in the person of a member of the State Police, who is detailed annually as a forest ranger and law enforcement officer for the hazard period of April and May to serve under the direction and supervision of the Division Chief.

The Town Councils in the thirty-two towns and in two of the seven cities in the State each appoint annually a Town Forest Warden, and these 34 Town Forest Wardens are so appointed subject to approval by the Chief of the Division of Forests, Parks and Parkways, under whose direction and supervision they are appointed to serve within the limits of their respective towns.

The 34 Town Forest Wardens may each appoint 6 Deputy Town District Forest Wardens to serve each in an assigned district of the town, and also may appoint for town service 10 town resident members of a special fire crew who are trained and experienced in fighting forest fires. The appointments of these Deputy Forest Wardens and these Fire Crew Members are not subject to approval by the Chief of the Division of Forests, Parks and

Parkways, and their status as members of the state system is recognized merely by registration with such Division Chief. In 1936 there were registered 121 Deputy Forest Wardens and 55 Fire Crew Members, and in 1937 such registrations totalled 135 Deputies and 56 Members.

In addition to this trained State personnel for forest fire suppression, any Forest Warden may press into temporary fire service any able-bodied male resident in his town between 18 and 50 years of age who is within range of call, and may command the use of horses and other private property in the town for purpose of fighting forest fires.

As a last resort, any Forest Warden may summon temporary fire aid from the Civilian Conservation Corps, and at each of the 6 CCC Camps 50 men are retained on duty over the week ends during the hazard period subject to call for forest fire suppression. In 1935 the CCC expended 1,110 man days fighting forest fires in Rhode Island, and 990 man days were likewise expended in 1936.

There is a semblance of concerted and unified state effort under state centralized authority and responsibility in this personnel organization as outlined.

In reality, however, Rhode Island has no permanently unified state system for forest fire protection, as some states have, with undivided responsibility and authority centralized in one state forest fire chief who devotes his full time to such duties. The Chief of the State Division of Forests, Parks and Parkways and his personally appointed Associate Forester both have a general but limited administrative authority over the Town Forest

Wardens, but these Wardens are essentially independent of each other and of State supervision, and their legal responsibility to such Chief is that they report forest fires to him within two weeks after occurrence.

Responsibility and authority for forest fire suppression in Rhode Island is divided among and vested in the 34 Town Forest Wardens by the State Legislature through the respective Town Councils that appoint them, except in a period of emergency so recognized by declaration of the Governor.

At the declared beginning of such emergency period, the State Director of Agriculture and Conservation immediately assumes direct charge with full authority and responsibility for all forest fire suppression activities in the State, and the three State District Forest Wardens then suddenly function under the Director with an authority superseding that of the Town Forest Wardens until the emergency period by the Governor is declared ended.

At the declared ending of such emergency period, the temporary unity of the state system breaks down, the State Director of Agriculture thereupon relinquishes direct charge and drops his full authority and responsibility, the three State District Forest Wardens as suddenly drop their authority and revert to an inactive status of officials advisory to the Director, and the responsibility for forest fire suppression in the State again becomes divided among the 34 Town Forest Wardens each having full authority therefor under his respective town council and within the limits of his respective town.

Nevertheless, all forest land in the State is receiving protection from forest fire and the 1936 record shows the comparatively small totals of 237 fires, 2,840 acres burned, and $10,681 in damages; and this record thus indicates a general improvement in protection efficiency over that of recent years.

B. PLANT DISEASE AND INSECT CONTROL

Such long-term planning as will tend to the best utilization of land in agriculture, avails little without provision for conservation of plant and animal life on farms, through control and eradication of injurious diseases and enemy insects.

1. BUREAU OF INFORMATION

For the general benefit of agriculture by the conservation of plant life in Rhode Island, the State Division of Entomology and Plant Industry, as stated in its annual report for 1935, functions in part as a bureau of information and advice, identifying insects and parasitic plant organisms and suggesting means of control for injurious species.

Records and specimens of all the injurious insects and plant diseases that are liable to occur in this locality are being collected, and in 1936 these covered 718 species of insects and 94 plant diseases, disclosing for information, by example, that there are 94 species of insects that may attack apple trees in Rhode Island and only 29 species that may attack elm trees. Studies of this nature facilitate the preparation of effective plans for combatting the possible invasions of insect species injurious to plant life.

Also, and in cooperation with Federal agencies, this Division takes an active and major part in the conservation of plant life in the State by the field extermination of plant diseases and enemy insects, as described in the following paragraphs.

2. INSPECTION OF NURSERIES

Nurseries in Rhode Island are certified as to status of, and are required to meet a definite standard for, freedom from injurious insects and plant diseases. The nurseries are inspected yearly and all of them were found in excellent condition during 1936, when the 71 nurseries in the State were inspected and all were granted licenses.

3. DUTCH ELM DISEASE

No trace of the destructive Dutch elm disease, which is fatal to elm trees, was found in Rhode Island during the 1935 field survey for determining the presence and extent of this disease in the State. Workers in this survey inspected numerous trees as they scouted 193,269 acres of forest growth for a trace of the Dutch elm disease; and of the officially estimated total of 200,000 elm trees in the State, the workers enumerated and mapped the location of the total number of 74,730 elm trees that border the streets and roadways throughout the State. In this survey it was found further that the State apparently has none of the European bark beetle and relatively few of the American species considered to be essential carriers of this disease.

In 1936 no trace of the Dutch elm disease was revealed after a thorough check-up of the suspicious elms noted in the survey of the previous year.

4. WHITE PINE BLISTER RUST

Blister rust is widely prevalent in Rhode Island and is the most destructive disease of white pines, though more fatal to young growths.

The whole State is scouted yearly in a general way by State and Federal agents for infestations of blister rust. To facilitate the scouting and eradication work, the State is being mapped to show the location of white pine areas with their density and age of growth, also the location of currant and gooseberry sites, the burnt sections, and other terrain features. In the 3-year period of 1934-1936 a total of 100,133 acres were so mapped.

The white pine blister rust has been kept in check in the State to the extent that no valuable pine stands have suffered much commercial damage. Control is maintained partly by educational and service work but chiefly by yearly field work in the eradication of its host plants, currant and gooseberry bushes. During the 1935 season the eradication work covered 101,060 acres and 110,920 ribes (host plants) were eradicated, and during 1936 such work covered 100,373 acres with the eradication of 94,054 ribes.

5. BROWN-TAIL AND GIPSY MOTHS

The brown-tail moth was effectively suppressed in 1916 and, beyond a few winter nests in Portsmouth and Barrington, which were discovered and removed in 1936, no further trace of this insect has been reported in the State in the past 20 years.

The gipsy moth causes serious and often fatal defoliation of forest, fruit, and shade trees. These insects prevail in troublesome numbers in Rhode Island, and widespread areas are scouted yearly for egg masses which are destroyed with applications of creosote, and the gipsy moths are further suppressed by spraying infested trees and their vicinity with arsenate of lead.

The gipsy moth has been kept under control in the State to the extent that no large areas of trees and comparatively few individual trees have been destroyed by this insect. However the state-wide increase of gipsy moths in 1935 taxed the facilities for suppression, and control work was confined to the more heavily infested areas, though in that year 13,645 infested trees were treated and 311,527 egg masses were destroyed.

During 1936 the gipsy moth control work included the scouting of 199,606.5 acres of woodland, the spraying of 104.2 miles of roadside, the treatment of 76,673 infested trees, and the destruction by creosoting of 759,663 egg masses having an average potential of 200 gipsy moths to each egg mass.

6. JAPANESE BEETLE

The Japanese beetle can become seriously injurious to fruits, vegetables, ornamental plant growth, and to lawns. A small infestation of Japanese beetles was first discovered in the State in 1919, and these insects now recur yearly in increasingly large numbers in Rhode Island, necessitating crop protection.

These beetles are sometimes combatted by spraying vegetation with arsenate of lead, but the chief method of destruction used in the state is that of trapping them in small combination metal and glass traps baited with sweet smelling plant oils.

Control of Japanese beetle has been maintained in the State so effectively that as yet this pest has done little appreciable damage. In 1935 there was a considerable increase in the number of these beetles in Rhode Island; in that year 100,232 beetles were caught in 763 traps, and in 1936 195,091 beetles were captured in 837 traps.

7. CORN BORER

The corn borer infests the stalk and ears of growing corn and may cause considerable agricultural loss.

The 1935 corn borer inspection work throughout Rhode Island showed that in the early crop of sweet corn, 31.16% of the plants examined were found infested by the first generation of corn borers; and that in the late crop of sweet corn, with the advent of the second generation of borers, 35.44% of the plants examined were found infested.

The extent of corn crop damage by corn borers in the State is perhaps more fully indicated when it is further stated that in the 1935 early crop of sweet corn, the number of first generation borers averaged less than one to each plant found infested; whereas in the late crop of sweet corn, the number of second generation borers averaged nearly 3 to each plant found infested.

No effective method is known for directly suppressing the annual second generation of corn borers, but a degree of such

control is indirectly attained through annual clean-up measures employed for suppressing the first generation; and the grower is assured an early crop of corn practically free from borer infestation by strict adherence to these measures of control.

Practical control of the annual first generation of corn borers is effected by plowing under and otherwise burying or burning no later than early spring all corn debris and other garden remnants that may harbor the corn borer. April 20th is the final date set by law in Rhode Island for completion of this clean-up work, and a yearly check-up throughout the State is made to secure compliance with the law.

8. OTHER INSECT WORK

The State Division of Entomology and Plant Industry also takes a major part in mosquito control work; and the Division cooperates further in an advisory capacity with individuals and with cities and towns of Rhode Island for the extermination or control of all other injurious insects and plant diseases.

Many insects are placed under observation in the State Insectary to determine their life histories and methods for suppressing them. Specimens of leaves, fruits, and woods from the trees and shrubs in the State are being collected by this Division for their educational value in showing host plants of various kinds of injurious insects.

All inter-state shipments of plants or seedlings in and out of Rhode Island are subject before shipment to inspection for freedom from injurious insects and plant diseases by an agent of the United States Department of Agriculture in the State from which shipment is made.

C. LIVESTOCK DISEASE AND REGULATION

For the conservation of animal life on farms and thus to the general benefit of agriculture in the State, the Rhode Island farmer receives Federal and State aid in the constant battle against livestock disease.

1. RESPONSIBLE AGENCY

The State Division of Animal Industry and Milk Control, through its Office of Animal Industry, is responsible for the control and eradication of infectious and contagious diseases among livestock in Rhode Island and, as stated in its annual report for 1935, also enforces locally the laws and regulations pertaining to the inter-state and intra-state movement of livestock. The Office of Milk Control, administered under this Division, is responsible for the enforcement of the local milk laws which safeguard the interests of the State's greatest agricultural activity, namely, dairying.

2. BOVINE TUBERCULOSIS

In cooperation with the United States Department of Agriculture, the Division of Animal Industry and Milk Control is working to eradicate tuberculosis among cattle in Rhode Island.

All cattle in the State are under compulsory supervision for the purpose of tuberculosis eradication, and are tuberculin-tested yearly by State or Federal agents working under a systematic area plan. Indemnities are paid jointly by the State and Federal Governments to owners of tubercular-infected cattle upon discovery of such infection and the compulsory slaughter of such animals.

Eradication of bovine tuberculosis in Rhode Island was nearly complete in 1936; as for that year the State Department of Agriculture and Conservation reports a total in the State of 31,335 cattle in 3,839 herds, of which 1,499 are accredited herds composed of 16,194 tubercular-free cattle; also in 1936 Rhode Island for the first time was declared by the United States Department of Agriculture to be a modified accredited state - that is, the number of tubercular-infected cattle in Rhode Island was in that year less than one-half of one percent of all cattle in the State.

Para-tuberculosis (Johne's Disease) is a form of tuberculosis that affects the intestines principally, and during 1935 and 1936 the Division of Animal Industry and Milk Control received no report of this disease among cattle in Rhode Island.

3. BANG'S DISEASE (Infectious abortion)

Official averages are reported to show that a cow suffering from Bang's disease causes an average yearly loss of $44.00 to the farmer; and the source of undulant fever among humans has in some cases been traced to milk from cows infected with this disease.

Of the 8,251 cattle tested in the State during 1935 for Bang's disease, 11.9% showed positive or suspicious reaction, whereas in the 1936 testing of 2,264 cattle, 21.7% showed positive or suspicious reaction; and on the basis of this work it is officially estimated that 18% to 20% of the cattle in Rhode Island may be infected with this disease.

Testing of cattle for Bang's disease is not compulsory upon farmers in Rhode Island, but the Division of Animal Industry cooperates with farmers toward its eradication. Indemnities are paid jointly by the Federal and State Governments to owners of cattle infected with the disease provided such animals are disposed of by slaughter.

This Division also actively advocates and encourages the vaccination of calves against Bang's disease, and for this purpose the Federal Government furnishes free the vaccine from Federal laboratories together with the services of a Federal veterinarian.

Calves under six months of age are not susceptible to Bang's disease, and vaccination of these young calves apparently renders them immune and also eliminates them as carriers of the disease.

Control of Bang's disease among cattle in Rhode Island is progressing slowly; in 1935 only 13 herds were State-accredited as free from this disease and in 1936 16 herds were so accredited. It is believed that more than that number of herds in the State are now free from Bang's disease, but if so such herds have not been inspected and so accredited by the Division of Animal Industry.

4. MASTITIS (or garget)

Cows infected with mastitis, a disease of the udder commonly called garget, usually are deficient in milk production and a menace to the health of milk consumers, as epidemics among humans of septic sore throat have been traced to a source in milk from cows suffering from this disease.

Very few cases of mastitis were brought to the attention of the Division of Animal Industry in 1936, and no state survey has been made to determine the actual extent of the disease among cattle in Rhode Island; but based on the average results of such surveys in other states, it is officially estimated that 15% to 18% of Rhode Island cattle may be infected with mastitis.

Rhode Island has no definite program, as provided in other states, for the eradication of mastitis; though an uncertain degree of control over this disease is effected in a roundabout way as follows:

Various field inspectors from the State Office of Milk Control, from the City of Providence, and from the local milk distributing companies, periodically visit the farms for purposes of milk inspection. When the inspection of milk indicates the presence of mastitis or other dangerous disease in a herd of cattle, the sale of all milk from that farm is stopped by the Division of Animal Industry and Milk Control until the known infection is eliminated from the herd, usually by slaughter of the infected animals. No indemnity is paid the farmer for loss by mastitis.

5. HOG CHOLERA

It is difficult to diagnose for hog cholera, though it is known that garbage-fed swine are very susceptible to this disease. It appears suddenly and spreads death quickly among swine, yet is effectively controlled by vaccination. For this purpose the Division of Animal Industry furnishes free the services of a veterinarian, and charges only the actual cost of the serum and virus to the hog owners.

During 1935 and 1936, immunity from disease was fairly well established among the state total of 5,965 hogs in Rhode Island as of January 1, 1935; as approximately 3,980 hogs were vaccinated against cholera and about 1,850 against hemorrhagic septicemia during 1935, and during 1936 a total of 4,485 hogs were so immunized.

6. GLANDERS AND RABIES

Glanders is an infectious and contagious disease of the nasal membrane and fatal to horses. This disease is reported on medical authority to be incurable, and control is maintained in Rhode Island by compulsory slaughter of horses so infected. The owner of such horse is paid an indemnity by the State. One case of glanders was reported in Rhode Island during 1935, and no such case was reported in 1936.

Rabies is a disease of the nervous system causing progressive paralysis and death in most cases. This disease primarily infects the dog, but may be transmitted to other animals and to humans. Control of rabies is maintained in Rhode Island by compulsory quarantine and vaccination of dogs so infected or exposed to such infection. No case of rabies was reported in Rhode Island during the years 1935 and 1936.

7. POULTRY DISEASES

Poultry diseases are numerous and many of them are fatal. Diseases that menace the poultry farming industry of the State are localized and kept under control by immediate and compulsory quarantine of the farm reported to have poultry afflicted with a serious and contagious disease.

Upon request adult poultry are tested for Pollorum infection by a State agent at the nominal charge of five cents for each bird

tested. Poultry so infected are killed under compulsory regulation which provides no indemnity. During the 1935-1936 season 17,648 birds were tested for Pollorum and 58 were found so infected, while during the 1936-1937 season 46,965 birds were tested and 560 were found infected.

The State continues to furnish the proper fowl pox vaccine to local poultry owners at cost; and 15,200 such doses were distributed in 1935, and in 1936 the distribution totalled 29,000 doses.

For the purpose of combatting other poultry diseases, the State further cooperates with the farmer in an advisory capacity through the Division of Animal Industry.

The Federal census reports 303,803 chickens over three months old in Rhode Island as of January 1, 1935.

Control of poultry diseases in Rhode Island is such that in total the poultry flocks were reported for 1935 and 1936 as free from disease epidemics that may menace the poultry industry of the State, and in total the poultry flocks in the State were reported also for these years to be in a condition of general good health as regards less serious diseases.

8. MOVEMENT OF LIVESTOCK

For the further protection of agricultural interests against animal diseases, the inter-state and intra-state movement of livestock is subject to statutory regulation in Rhode Island, and to supervision by the Office of Animal Industry.

With the exception of poultry, all livestock when entering the State must be accompanied by a health certificate showing for each animal a condition of good health. Livestock thus uncertified

are quarantined and tested to establish their condition of health, and all livestock thus found to be infected with a serious disease are held in strict quarantine until slaughtered.

In particular all cattle for any reason moved into, or through, Rhode Island or moved from place to place within the State, are subject to exacting regulations designed to establish definitely the identification of each animal and its condition of health.

D. LAND USE IN GENERAL

The land area of Rhode Island is shown in Chart IV as divided by acreage and percentage in specific farm use and in general non-farm use; and the same total land area is shown on Map B by geographical distribution according to general use as farm or non-farm lands.

The non-farm lands consist in small part of inland water areas numbering 20,500 acres and in larger part also of rural open land areas numbering 41,800 acres utilized variously for residential and recreational purposes; but the non-farm lands consist in greater part of thickly populated urban areas numbering 85,000 acres and in greatest part also of forest, brush and scrub land areas numbering 238,735 acres; a total for Rhode Island, based on the 1935 United States Agricultural Census, of 386,035 acres in non-farm lands.

During the 80-year interval between 1850 and 1930, the State's area in farms decreased nearly 50% from a total of 553,938 acres in 1850 to a total of 279,361 acres in 1930; while for the same period the State's population increased 465% from a total of 147,545 persons in 1850 to a total of 687,497 persons in 1930 according to United States Census figures. It may be observed

on Map B that the thickly populated urban areas are found mostly in the coastal lowlands comprising in great part the eastern one-third of Rhode Island, where dwell 94.6% of the State's population; and that the forest, brush and scrub land areas are found mostly throughout the western two-thirds of Rhode Island which consists in most part of hilly uplands.

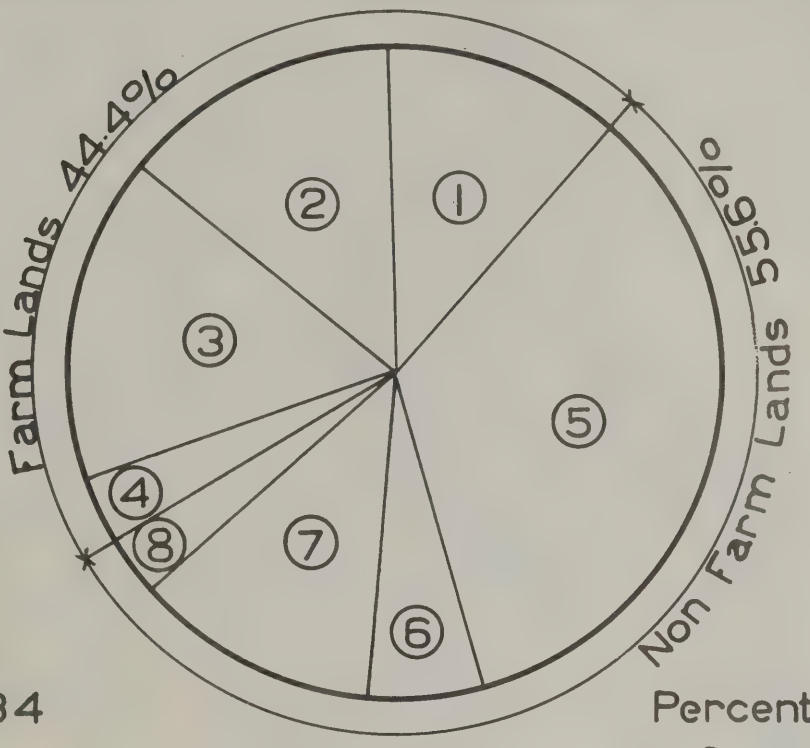
These hilly uplands were regarded as good agricultural lands when the forest cover protected the soil, and thus many thousands of acres in this western section were cleared of forest growth and farmed in earlier times. But the greater part of the soil in this section, later classed in the 1904 Federal soil survey as the generally unproductive Glocester stony loam, was found in the course of time to be shallow, of rough texture, and of inferior fertility for general farming, except in a comparatively few areas at the foot of slopes where a considerable depth of silt and loam of this type of soil had accumulated. Furthermore, with the surface rough or hilly and encumbered with rock boulders and glacial erratics scattered profusely over the land, tilling was found to be difficult. Experience at length convinced the farmer that most of the land in this western two-thirds of Rhode Island is naturally less suitable to profitable tillage than to forestry, and consequently thousands of acres in these hilly uplands were gradually abandoned for farming and allowed to revert to forest and scrub growth. Meanwhile the greater part of the rapidly increasing population in the State concentrated in the growing eastern urban areas which were the centers of trade and manufacturing.

RHODE ISLAND LAND USE CHART

FARM LANDS ACCORDING TO USE
(Statistics of U.S. census Year 1935)

NON - FARM LANDS ACCORDING TO USE
(Official Figures Of State Planning Board)

DRAWN BY STATE PLANNING BOARD JUNE 1937



YEAR 1934		Percent Of	Percent Of Total
FARM LANDS IN USE FOR	Acreage	All Lands	Farm Lands
1. Crop Land	78,195	11.3%	25.4%
2. Pasture Land	94,202	13.6	30.6
3. Wood Land	112,338	16.2	36.5
4. Other Farm Land	22,990	3.3	7.5
Total Farm Lands	307,725	44.4	100.0
NON- FARM LANDS IN USE FOR			
5. Forest, Brush, Scrub Land	238,735	34.4	
6. Rural Non-Farm Land *	41,800	6.0	
7. Thickly Populated Areas †	85,000	12.2	
8. Inland Water Areas	20,500	3.0	
Total Non-Farm Lands	386,035	55.6	
State Total For All Lands	693,760	100.0	

* Sparsely Settled Areas, Country Estates, Summer Resorts, Golf Courses.

† All Cities And Built Up Portions Of Towns And Villages.

MAP OF THE STATE OF RHODE ISLAND SHOWING GENERALIZED LAND USES

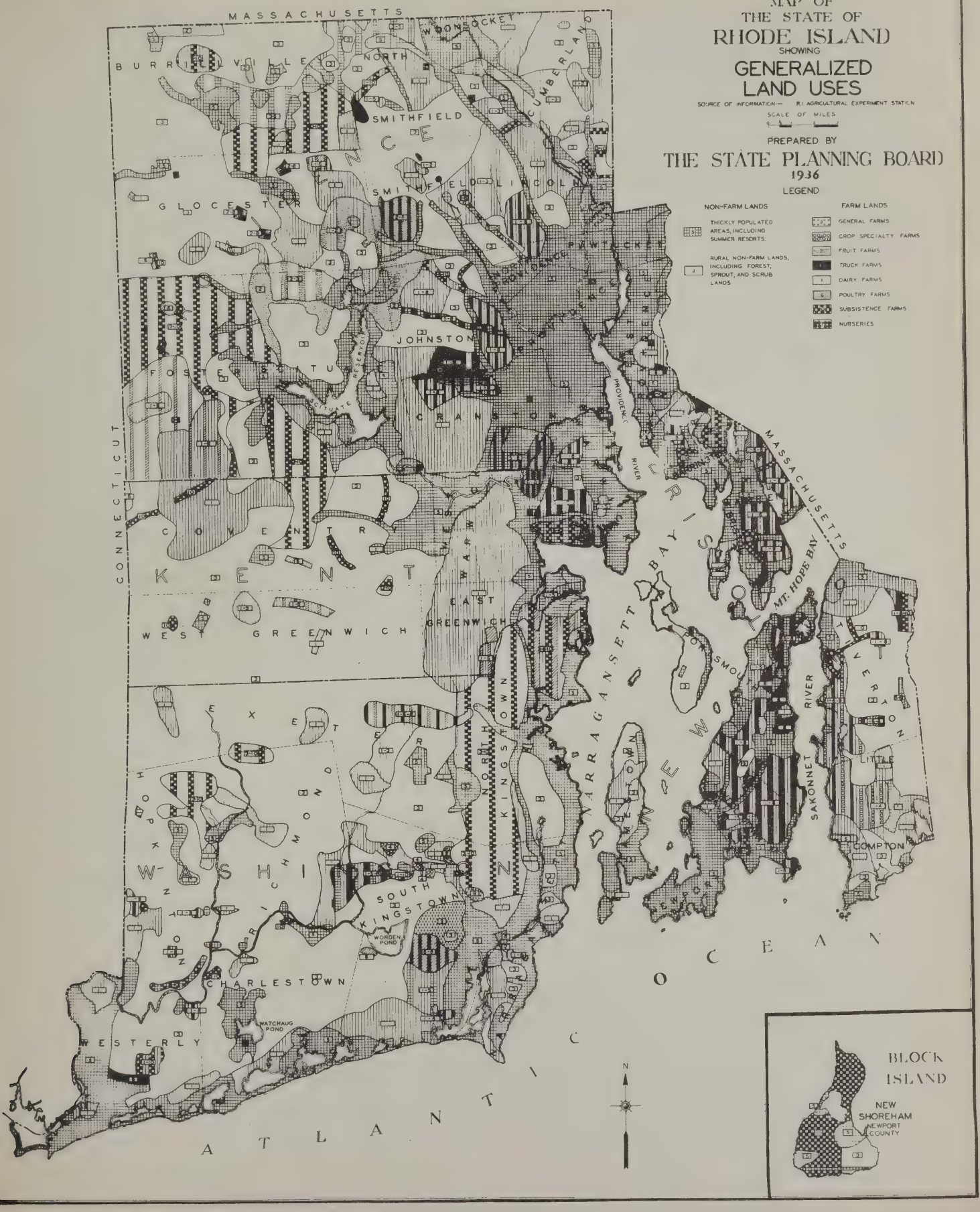
SOURCE OF INFORMATION:— R.I. AGRICULTURAL EXPERIMENT STATION

SCALE OF MILES

PREPARED BY

THE STATE PLANNING BOARD

1936



LEGEND

NON-FARM LANDS

- THICKLY POPULATED AREAS, INCLUDING SUMMER RESORTS.
- RURAL NON-FARM LANDS, INCLUDING FOREST, SPROUT, AND SCRUB LANDS

FARM LANDS

- GENERAL FARMS
- CROP SPECIALTY FARMS
- FRUIT FARMS
- TRUCK FARMS
- DAIRY FARMS
- POULTRY FARMS
- SUBSISTENCE FARMS
- NURSERIES

The farm lands in Rhode Island are scattered in all five counties throughout the State, but by far the greater number of the larger and more prosperous farms are found in the coastal lowlands of the eastern one-third of the State. The greater part of the soil there, identified in the 1904 Federal soil survey as the naturally productive Miami stony loam, is shallow but of fine texture, and of fertility suitable for general farming. The surface is level or low-rolling and less encumbered with rocks. The land in that section of the state is therefore the most adaptable to tillage.

In the Federal Census of 1930 the farm lands of Rhode Island are shown to have consisted principally of 24.4% crop lands, 36.0% pasture lands, and 30.0% wood lands, showing no great variation in the percent of farm acreage used for each such purpose. The remaining 9.6% of the total farm acreage was classified as "other" farm lands.

The ratio of non-farm to farm lands in Rhode Island is illustrated in Chart IV, showing that in the Federal Census of 1935 the State's land area consisted of 55.6% non-farm and 44.4% farm lands, increase of 4.1% in farm lands over such relative percentage for like lands shown in the 1930 Federal Census.

E. LAND USE IN AGRICULTURE

Of a total land area in Rhode Island of 693,760 acres, 40.3% of the total, or 279,361 acres, were designated as farm lands according to use in 1929 by the United States Census of Agriculture in 1930. An analysis of the use of farm land acreage for the year

1929 shows that 68,256 acres were used for crops, and 100,432 acres for pasturage. Woodland covered 83,735 acres, and undesignated farm lands comprised 26,938 acres.

A more recent and more detailed agricultural condition is presented for comparison in a break-down of the farm lands in the State by use and acreage in counties, based upon a report by the United States Census of Agriculture in 1935, showing 44.4% of the State's land area in farms according to use in 1934, as given in Tables 3 and 4.

Table 3

Rhode Island Farm Lands in Counties by Use and Acreage, 1934

County	Total acreage* all lands	Acres in Farm Lands Used for: Crop land	Pasture land	Wood-land	Other farm land	Total acreage farm lands
Providence	276,774	25,778	26,622	38,283	8,760	99,443
Washington	212,781	21,723	31,910	46,998	6,304	106,935
Kent	111,904	8,920	16,927	20,891	4,923	51,661
Newport	76,358	18,206	16,846	4,838	2,617	42,507
Bristol	15,943	3,568	1,897	1,328	386	7,179
State	693,760	78,195	94,202	112,338	22,990	307,725

* Official figures of State Planning Board.

Table 4

Rhode Island Farm Lands in Counties by Use and Percentage, 1934

County	Percent of * all lands in farmlands	% of Total acreage farm lands uses for Crop land	Pasture land	Wood-land	Other farm land
Newport	55.7%	42.8%	39.6%	11.4%	6.2%
Washington	50.3	20.3	29.8	44.0	5.9
Kent	46.2	17.3	32.8	40.4	9.5
Bristol	45.1	49.7	26.4	18.5	5.4
Providence	35.9	25.9	26.8	38.5	8.8
State	44.4	25.4	30.6	36.5	7.5

* Based on State land area of 693,760 acres.

PART III
AGRICULTURAL TRENDS IN RHODE ISLAND

A. TRENDS IN FARM LANDS

1. FARM LANDS IN THE AGGREGATE

The number and acreage of Rhode Island farm lands in the aggregate have declined generally since 1850, as set forth in Table 5; this downward trend is shown by counties in Table 6. The figures used in these and subsequent tables are based on reports of the United States Bureau of the Census.

Table 5

Number and Acreage of Farms in Rhode Island, 1850 - 1935

Year	Total no. of farms in state	Total farm acreage	% of state land area* in farms	Amount of total farm acreage improved	% of total farm acreage improved
1850	5,385	553,938	79.8%	356,487	64.4%
1860	5,406	521,224	75.1	335,128	64.3
1870	5,368	502,308	72.4	289.030	57.5
1880	6,216	514,813	74.2	298.486	58.0
1890	5,500	469,281	67.6	274,491	58.5
1900	5,498	455,602	65.7	187,354	41.1
1910	5,292	443,308	63.9	178,344	40.2
1920	4,083	331,600	47.8	132,855	40.1
1925	3,911	309,013	44.5	186,988	60.5
1930	3,322	279,361	40.3	168,688	60.3
1935	4,327	307,725	44.4	172,397	56.0

* State land area of 693,760 acres.

Table 6

Distribution of Rhode Island Farms by Counties, 1900 - 1935

Year	Providence Co.		Washington Co.		Newport Co.		Kent County		Bristol Co.	
	No.	Acres	No.	Acres	No.	Acres	No.	Acres	No.	Acres
1900	2,287	167,437	1,292	159,992	940	48,652	774	71,936	205	7,585
1910	2,193	166,343	1,224	151,218	1003	47,240	638	68,956	234	9,551
1920	1,639	122,825	975	117,088	823	42,639	431	40,810	215	8,238
1925	1,532	119,879	811	103,025	905	41,183	450	36,101	213	8,825
1930	1,340	101,173	621	87,011	625	37,286	592	46,286	144	7,605
1935	1,492	99,443	1,019	106,935	868	42,507	755	51,661	193	7,179

2. SIZE OF INDIVIDUAL FARMS

The decline of total acreage in farm lands since 1850 is accompanied by the decline in the average size of individual farms in Rhode Island, as shown in Tables 7 and 8.

Table 7

Average Size of Rhode Island Farms, 1850 - 1935

Year	Total no. of farms in state	Average size of farms in acres	Average per farm improved land in acres	Av. per farm % of all farm land improved
1850	5,385	102.9	66.2	64.4%
1860	5,406	96.4	62.0	64.3
1870	5,638	93.6	53.8	57.5
1880	6,216	82.8	48.0	58.0
1890	5,500	85.3	49.9	58.5
1900	5,498	82.9	34.1	41.1
1910	5,292	83.8	33.7	40.2
1920	4,083	81.2	32.5	40.1
1925	3,911	79.0	47.7	60.5
1930	3,322	84.1	50.8	60.3
1935	4,327	71.1	39.8	56.0

Table 8

Number of Rhode Island Farms by Size Groups, 1880 - 1935

Year	Total no. of farms in state	Under 10 acres	10-19 acres	20-49 acres	50-99 acres	100-499 acres	500 acres and over
1880	6,216	430	607	1,391	1,706	2,029	53
1890	5,500	420	611	1,239	1,433	1,751	46
1900	5,498	834	578	1,169	1,256	1,599	62
1910	5,292	730	647	1,144	1,264	1,432	75
1920	4,083	451	485	983	1,031	1,075	58
1925	3,911	489	522	894	962	1,002	42
1930	3,322	453	397	729	817	883	43
1935	4,327	845	614	974	939	900	55

3. FARM OPERATION BY TENURE

The trend in farm operation since 1880 indicates for Rhode Island a slight increase in the percentage of farms and farm acreage under owner-management, as shown in Tables 9 and 10.

Table 9

Rhode Island Farms by Tenure of Operator, 1880 - 1935

Year	Total no. of farms in state	Owner management	% state	Hired management	% state	Tenant management	% state
1880	6236	4980 (1)	80.1	(2)	(2)	1236	19.9
1890	5500	4470 (1)	81.3	(2)	(2)	1030	18.7
1900	5498	4182	76.0	208	3.7	1108	20.3
1910	5292	4087	77.2	251	4.8	954	18.0
1920	4083	3245	79.5	205	5.0	633	15.5
1925	3911	3263	83.4	176	4.5	472	12.1
1930	3322	2808	84.4	99	3.0	415	12.6
1935	4327	3635	84.0	95	2.2	597	13.8

(1) Includes farms under hired-management.
(2) Included with farms under owner-management.

Table 10

Farm Acreage in Rhode Island by Tenure of Operator, 1900 - 1935

Year	Total farm acreage in state	Owner management	% state	Hired management	% state	Tenant management	% state
1900	455,602	335,354	73.6	28,700	6.3	91,548	20.1
1910	443,308	318,262	71.8	44,436	10.0	80,610	18.2
1920	331,600	248,934	75.1	29,792	9.0	52,874	15.9
1925	309,013	247,589	80.1	24,021	7.8	37,403	12.1
1930	279,361	220,535	79.0	17,419	6.2	41,407	14.8
1935	307,725	231,154	75.1	29,038	9.4	47,533	15.5

B. TRENDS IN FARM PRODUCTS

1. DAIRY PRODUCTS

The production of cheese "made on farms" in Rhode Island was 316,508 pounds in 1849 and since then it has gradually become of so little importance that it has not been reported since 1920.

Butter "churned on farms" in Rhode Island attained a production of 1,021,767 pounds in 1859 and gradually fell to a production of 61,561 pounds in 1934. The trend since 1859, however, shows a considerable increase in the production and sale of whole milk. Figures since the year 1899 are given in Table 11.

Table 11

Dairy Products of Rhode Island Farms, 1899 - 1934

Year	Milk produced in gallons	Whole milk sold in gallons	Cream sold not as butterfat in gals.	Cream sold as butterfat in lbs.	Butter churned on farms in lbs.	Cheese made on farms in lbs.
1899	12,923,512(1)	4,685,988	95,321	(2)	488,086	6,751
1909	12,177,738(1)	8,796,847	42,421	5,347	339,607	3,860
1919	12,099,111(1)	9,313,548	30,022	15,524	174,902	10,410
1924	13,503,758(1)	11,392,075	16,325	7,501	131,872	(2)
1929	14,889,788	13,521,798	23,325	9,596	53,152	(2)
1934	14,457,720	(2)	(2)	(2)	61,561	(2)

(1) Including estimates for incomplete reports. (2) Not reported.

2. POULTRY PRODUCTS

Chickens and chicken eggs are by far the major poultry products of Rhode Island farms. The number of chickens raised and of chicken eggs produced, have gradually increased in Rhode Island since 1919, as shown in Table 12.

Table 12

Poultry Products of Rhode Island Farms, 1899 - 1934

Year	Chickens raised	Chicken eggs produced in dozens	Other poultry raised	Other poultry eggs produced in dozens
1899	(2)	3,217,310(1)(3)	(2)	(4)
1909	569,809 (1)	2,862,246 (1)	32,526 (1)	31,835 (1) (5)
1919	433,668 (1)	1,536,858 (1)	(2)	(2)
1924	519,211 (1)	2,274,701 (1)	(2)	(2)
1929	608,479	2,468,706	21,513 (6)	(2)
1934	655,445	2,457,507	(2)	(2)

(1) Including estimates for incomplete reports. (2) Not reported.
(3) Includes other poultry eggs. (4) Included with chicken eggs.
(5) Duck eggs. (6) Turkeys 12,784; ducks 6,840; geese 1,889.

3. WOOL AND MOHAIR

The farm production of mohair, obtained from Angora goats only, is a decreasing and insignificant quantity in Rhode Island; and the production of wool, which was 90,699 pounds in 1859, is also decreasing on Rhode Island farms, as shown in Table 13.

Table 13

Production of Wool and Mohair, 1899 - 1934

Rhode Island Farms

Year	Sheep & Lambs on farms Census year following	Sheep & lambs shorn	Wool Shorn in pounds (unwashed)	Goats & kids on farms Census year following	Goats & kids clipped	Mohair clipped in pounds (unwashed)
1899	11,207	6,828 (3)	35,180 (1)	23	3 (4)	10
1909	6,789	4,353 (3)	24,009 (1)	106	1 (4)	2
1919	2,736	2,228 (1)	13,488 (1)	116	13	72
1924	1,897	1,420 (1)	8,684 (1)	53	11	81
1929	3,060	1,572	9,268	167	10	29
1934	2,276	1,901	11,226	(2)	(2)	2

(1) Including estimates for incomplete reports. (2) Not reported.
(3) Fleeces, including estimates. (4) Fleeces.

4. HONEY AND WAX

The production of honey and beeswax is decreasing on Rhode Island farms and is of little commercial importance, as shown in Table 14.

Table 14

Production and Value of Honey and Wax, 1899 - 1934

Rhode Island Farms

Year	Hives of bees on farms Census year following	Honey produced in pounds	Beeswax produced in pounds	Value of bees on farms Census year following	Value of honey produced	Value of wax produced
1899	1,681	28,450	890	$ 6,795	$ 5,156(2)	$ (3)
1909	1,267	14,221	185	6,138	2,904	55
1919	686	6,488	57	6,189	1,687	17
1924	(1)	(1)	(1)	(1)	(1)	(1)
1929	733	11,693	(1)	6,159	3,508	(1)
1934	(1)	(1)	(1)	(1)	(1)	(1)

(1) Not reported. (2) Includes wax. (3) Included with honey.

5. SOIL PRODUCTS

The soil products of Rhode Island farms are considerably diversified and include the staple cereal grains, various seeds, hay and forage of several kinds, the staple vegetables, a variety of farm

garden truck, several classes of orchard and small fruits, nursery and greenhouse products, some forest products, and miscellaneous other crops of very minor importance.

The four major single crops on the basis of value are hay, corn, potatoes, and apples.

There is a variably downward trend in the harvested acreage and production of the four major single crops in Rhode Island, as shown in Tables 15 and 16.

Table 15

Major Single Crops - Acres Harvested, 1899 - 1934

Rhode Island Farms

Year	Hay acres	Corn for silage acres	Corn for grain acres	Potatoes (Irish or white) acres	Apples trees of bearing age
1899	66,993	(1)	8,149	5,816	213,598
1909	59,602	(1)	9,679	4,649	152,009
1919	43,984	2,557	7,324	3,149	173,110
1924	48,013	3,933	2,807	2,110	165,856
1929	33,848	4,594	1,852	1,865	150,072
1934	41,998	(1)	2,287	3,730	178,594

(1) Not reported separately.

Table 16

Major Single Crops - Production Harvested, 1899 - 1934

Rhode Island Farms

Year	HAY tons	Corn for silage tons	Corn for grain bushels	Potatoes (Irish or white) bushels	Apples bushels
1899	67,668	(1)	288,220	843,853	339,445
1909	72,258	(1)	398,193	552,677	212,908
1919	54,522	26,341	310,901	293,087	334,308
1924	48,281	36,413	112,421	254,373	271,307
1929	43,311	42,783	76,463	237,056	261,905
1934	52,700	(1)	72,838	697,481	219,315

(1) Not reported separately.

C. TRENDS IN FARM FINANCES

1. INCOME VALUE OF ALL FARM PRODUCTS

For the NET value of all farm products - that is, the actual amount added to the wealth of the State through the operation of the farms - there is no figure available which will represent even approximately such a value.

Moreover, the REPORTED GROSS value of all farm products - that is, the sum of the values of all farm products as reported and estimated in the United States Census - is not an absolute measure of the TRUE GROSS agricultural income because of the serious element of duplication involved and because of the non-inclusion of minor items of income.

However, the "reported gross value of all farm products", as defined, approaches sufficiently close to the true gross value to serve for many practical purposes as a very satisfactory index of the trend or progress and relative importance of the agricultural industry in the State.

The reported gross value of all farm products in Rhode Island has been steadily increasing for many years and, inasmuch as the reported number and acreage of Rhode Island farms have been steadily decreasing, this upward trend in value of farm products reflects the continuous intensification of farming operations in the State, as shown somewhat in detail by classes of products in Table 17 and as summarized by aggregate values in Table 18.

Table 17

Reported Gross Value of All Farm Products, 1899 - 1929

Rhode Island Farms

Farm products by class	1899	1909	1919	1929
Crops Harvested:-	$2,487,748	$2,986,816	$5,340,378	$3,020,724
Hay	1,081,482(6)	1,258,357	1,851,027	822,552
Corn for silage	(13)	(13)	302,923	275,118
Corn for grain	164,138	335,629	606,256	91,755
Potatoes	440,372	408,429	674,100	426,700
Apples	155,571(3)	147,125	668,616	392,858
All other crops	646,185	837,276(2)	1,237,456	1,011,741
Plants, etc.:-	357,101	634,087	1,203,802	1,344,692
Nursery sales	42,295	75,544	101,739	255,515
Greenhouse sales	314,806	558,543	1,102,063	1,089,177
Forest Products:-	195,472	312,022	470,077	330,776
Cut on farms	195,472	312,022	470,077	330,776
Livestock products:-	2,993,241	3,406,278	5,367,881	7,202,325
Dairy products-	1,923,707	2,065,941	3,830,881	4,916,146
Consumed on farms	207,296	(12)	(12)	355,998(11)
Milk sold	1,536,279	1,903,546	3,667,306	4,462,193
Cream sold	71,142	55,997	43,522	67,232
Butterfat sold	(12)	1,622	10,471	4,798
Butter churned	81,343(10)	104,161	105,834	25,925
Cheese made	647(10)	615	3,748	(12)
Poultry products-	1,055,635	1,330,542	1,526,891	2,279,136
Chickens raised	398,790(7)	451,166	620,145	973,567
Ch. eggs produced	656,845(7)	837,496	906,746	1,218,390
Other poultry eggs	(8)	11,031	(12)	(12)
Other poultry raised	(8)	30,849	(12)	87,179(5)
Wool products-	8,743	6,836	8,405	3,535
Wool shorn	8,741	6,835	8,363	3,522
Mohair clipped	2	1	42	13
Honey and Wax-	5,156	2,959	1,704	3,508(9)
Domestic Animals:-	300,302	746,583	1,300,000(1)	1,045,841
on farms, sold-	157,478(4)	580,949	(12)	(8)
slaughtered-	142,824	165,634	(12)	(8)

(1) Not reported but estimated by Census Bureau in 1920 census.
(2) Misc. crops with no acreage report, value $4152, omitted for trend.
(3) All orchard fruits and products, including cider, vinegar, etc.
(4) Restricted to sales of "Animals Raised" on farms reporting.
(5) Value of turkeys $70,313; Ducks $11,104; Geese $5,762.
(6) Includes forage. (9) Honey only. (11) Milk used on farms.
(7) All poultry. (10) Product sold. (12) Not reported.
(8) Not reported separately. (13) Included with "Other Crops."

Table 18

Reported Gross Value of All Farm Products, 1899 - 1929

Rhode Island Farms

Farm products in aggregate	1899	1909	1919	1929
Crops harvested	$2,487,748	$2,986,816(1)	$5,340,378	$3,020,724
Plants, etc.: sold	357,101	634,087	1,203,802	1,344,692
Forest products: cut	195,472	312,022	470,077	330,776
Livestock products	2,993,241	3,406,278	5,367,881	7,202,325
Animals sold-slgtrd.	300,302	746,583	1,300,000(2)	1,045,841
Total Values	6,333,864	8,085,786	13,682,138	12,944,358

(1) Misc. crops with no acreage report, value $4152, omitted for trend.
(2) Not reported but estimated by Census Bureau in 1920 census.

When interpreting Tables 17 and 18 for comparative values reflecting increased production between 1909 and 1919, consideration should be given to the increase in values due to higher prices prevailing in 1919. This is a matter of personal interpretation as little relative data is available and none is given for Rhode Island. Figures for the whole United States, however, furnished by the Census Bureau for crops only, show that between 1909 and 1919 the increase in value due to greater production is 9% and the increase due to higher prices is 156.5% for "all crops."

2. MAJOR EXPENDITURES ON FARMS

The census of 1930 reported that in 1929 farmers in Rhode Island paid to power companies $153,011 for electric light and power, and expended $581,345 for implements and machinery.

Feed, fertilizer, and labor are the three major farm operating expenditures for which comparative statistical data are available, and the trend shows that these three expenditures have climbed steadily in Rhode Island until in 1929 they had reached a combined total of $5,660,258, as given in Table 19.

Table 19

Major Expenditures on Rhode Island Farms, 1899 - 1929

Year	Feed (2) for livestock	Fertilizer(1) all kinds	Farm labor(4) in cash	Total specified expenditures
1899	(6)	$ 264,140	$ 1,032,360(3)	$ 1,296,500(5)
1909	$ 1,678,183	335,103	1,429,388	3,442,674
1919	2,889,450	379,786	1,730,402	4,999,638
1924	3,046,410	301,414	1,894,161	5,241,985
1929	3,047,274	336,196	2,276,788	5,660,258

(1) All fertilizers - commercial, manure, marl, lime, ground limestone.
(2) "Not raised on this farm." (4) Exclusive of housework.
(3) Includes value of board. (5) Omitting feed. (6) Not reported

3. NUMBER AND VALUE OF SPECIFIED LIVESTOCK

The most important classes of livestock on Rhode Island farms -- namely; horses, mules, cattle, sheep, swine and chickens -- show a downward trend in numbers, as given in Table 20; and the values of these classes of livestock show a variable but upward trend relative to the respective number of livestock, as given in Table 21.

Table 20

Number of Specified Livestock on Rhode Island Farms, 1900 - 1935

Year	Horses(3) & colts	Mules(3) & colts	Milk cows 2 yrs. & over	Other cattle all ages	Sheep & lambs	Swine all ages	Chickens over 3 mos. old
1900	11,390	38	23,660	12,374	11,207	11,508	520,514 (5)
1910	9,547	63	20,068	14,080	6,789	14,038	392,704
1920	6,540	75	21,431	9,088	2,736	12,869	253,607 (6)
1925	5,368	92	21,961	5,242	1,897	4,175	361,393 (6)
1930	3,199 (1)	67 (4)	19,171	12,462	3,060	4,811	304,733
1935	3,290	52	21,762 (2)	6,143	2,276	5,965	303,803

(1) Includes 92 colts. (4) Includes 4 colts. (6) Regardless of age.

(2) Both milk & beef. (5) Includes turkeys, ducks, geese, guinea fowls.

(3) Colts are here itemized in 1930 for comparison with Table 32; but all figures respectively include a small number of colts.

Table 21

Value of Specified Livestock on Rhode Island Farms, 1900 - 1935

Year	Horses & colts	Mules & colts	All cattle all ages	Sheep & lambs	Swine all ages	Chickens over 3 mos. old
1900	$ 980,948	$ 2,835	$1,165,797	$41,282	$ 90,614	$305,047 (1)
1910	1,424,177	11,155	1,309,088	32,637	123,647	344,452
1920	972,111	9,087	2,984,096	37,319	331,138	471,456 (2)
1925	641,080	9,135	2,081,441	16,487	79,126	610,735 (2)
1930	400,494	7,346	2,959,475	26,607	71,864	411,389
1935	409,307	5,200	1,652,321	10,697	57,264	318,993

(1) Includes value of turkeys, ducks, geese, guinea fowls.
(2) Regardless of age.

4. CAPITAL VALUE OF ALL FARM PROPERTY

Despite the steady decrease in the acreage of farms and in the number of farms and livestock since 1850, all farm property in Rhode Island shows a steady increase in value from $19,100,640 in 1850 to $41,111,441 in 1930.

The values of farm property from 1850 to 1935 are given in Table 22, and the average values per farm of such property are given in Table 23.

Table 22

Reported Capital Value of All Farm Property, 1850 - 1935

Rhode Island Farms

Year	Value of all farm property	Value of farm lands & buildings	Value of farm buildings	Value farm implements & machinery	Value of all farm livestock
1850	$19,100,640	$17,070,802	$	$ 497,201	$1,532,637
1860	22,179,388	19,550,553		586,791	2,042,044
1870 (1)	20,397,077	17,259,974		628,997	2,508,106
1880	29,039,046	25,882,079		902,825	2,254,142
1890	25,179,479	21,873,379		941,030	2,364,970
1900	26,989,189	23,125,260	9,703,490	1,270,270	2,593,659
1910	32,990,739	27,932,860	12,922,879	1,781,407	3,276,472
1920	33,636,766	26,387,926	11,878,853	2,408,561	4,840,279
1925	33,446,425	27,920,365	14,377,229	2,063,716	3,462,344
1930	41,111,441	34,507,749	17,893,540	2,718,369	3,885,323
1935		35,237,660			

(1) Computed gold values, being 80% of the currency values reported.

Table 23

Average of Reported Values of All Farm Property, 1850 - 1935

Rhode Island Farms

Year	Total no. of farms in state	Av. value per farm All farm property	Av. value per farm Land & buildings	Av. value per farm Implements & machinery	Av. value per farm Live-stock	Av. value per acre Land & buildings
1850	5,385	$ 3,547	$ 3,170	$ 92	$ 285	$ 31
1860	5,406	4,103	3,616	109	378	38
1870 (1)	5,368	3,800	3,215	117	467	34
1880	6,216	4,672	4,164	145	363	50
1890	5,500	4,578	3,977	171	430	47
1900	5,498	4,909	4,206	231	472	51
1910	5,292	6,234	5,278	337	619	63
1920	4,083	8,238	6,463	590	1,185	80
1925	3,911	8,552	7,139	528	885	90
1930	3,322	12,376	10,388	818	1,170	124
1935	4,327	--	8,144	--	--	115

(1) Computed gold values, being 80% of the currency values reported.

5. MORTGAGE ON "OWNER-OPERATED" FARMS

Farm mortgage statistics for "owner-operated" farms are given in Tables 24, 25, and 26, showing that since 1890 there have been increases in the percentage of such farms mortgaged; in the total amount of their mortgage debt, and in their average mortgage debt.

Table 24

Number and % of Owner-Operated Farms Mortgaged, 1890 - 1930

Rhode Island Farms Reporting Mortgages

Year	Owner-operated farms	Number mortgaged	Per cent mortgaged	Free from mortgage	No report on mortgage
1890	4,125 (1)	771 (2)	18.7%	3,276(2)	78(2)
1900	4,229 (1)	1,061	25.1	2,853	315
1910	4,087	1,180	28.9	2,811	96
1920	3,245	949	29.2	1,971	325
1925	3,263	946	29.0	(3)	(3)
1930	2,808	1,026	36.5	1,619	163

(1) Farm homes occupied by their owners. (3) Number not reported.
(2) In the reports of the 1890 census the 78 owned farm homes without mortgage report were in some instances distributed 63 to the "free from mortgage" group of 3,276 making a total of 3,339 shown in some places for this group, and 15 to the "mortgaged" group of 771 making a total of 786 shown in some places for this latter group.

Table 25

Realty Value and Mortgage Debt of Owner-Operated Farms, 1890 - 1930

Rhode Island Farms Reporting Amount of Mortgage Debt

Year	Mortgaged farms reporting	Value of land and buildings	Amount of Mortgage dibt	Ratio of mtg. dibt to Value
1890	786(1)	$2,814,715(2)	$1,198,726(2)	42.6%(2)
1900	(3)	(3)	(3)	(3)
1910	1001	4,087,933	1,356,326	33.2
1920	856	4,864,643	1,494,367	30.7
1925	869	5,184,887	1,971,250	38.0
1930	892	7,992,194	2,655,119	33.2

(1) Includes owned farms without mortgage report. See notes of Table 24.
(2) Includes estimates for owned farms without mortgage report.
(3) Not reported.

Table 26

Averages per Mortgaged Farm in Rhode Island, 1890 - 1930

Owner-Operated and Reporting Amount of Mortgage Debt

Year	Mortgaged farms reporting	Average value land & bldgs.	Average amount mortgage debt	Average owner equity
1890	786(1)	$3,581(2)	$1,525(2)	$2,056(2)
1900	(3)	(3)	(3)	(3)
1910	1001	4,084	1,355	2,729
1920	856	5,683	1,746	3,937
1925	869	5,966	2,268	3,698
1930	892	8,960	2,977	5,983

(1) Includes owned farms without mortgage report. See notes of Table 24.
(2) Includes estimates for owned farms without mortgage report.
(3) Not reported.

6. SALES AND PURCHASES BY FARM COOPERATIVES

Data relating to cooperative marketing of farm products and cooperative purchasing of supplies by farmers were first collected in the census of 1920, and the subsequent data available show the financial value of farmers' cooperative activities to be rel-

atively insignificant compared with the gross value of farming operations as given in Tables 17, 18, and 30, and also shows but little effective increase in the total financial value of sales and purchases through farmers' cooperative organizations in Rhode Island, as given in Table 27.

Table 27

Sales and Purchases on Rhode Island Farms, 1919 - 1929

Through Farmers' Cooperative Organizations

Year	No. farms in state census year following	Reporting Cooperative sales	Reporting Cooperative purchases	Value of Cooperative sales	Value of Cooperative purchases
1919	4,083	95	86	$222,078	$ 30,534
1924	3,911	235	213	570,659	122,670
1929	3,322	140	148	307,824	171,679

PART IV

CURRENT AGRICULTURAL FACTS

A. CYCLE STATUS OF AGRICULTURE

The three centures of Rhode Island's history (1636 - 1936) respectively coincide in a general way with the duration of her three industrial cycles; namely, - agriculture, maritime commerce, and industrial manufacturing. Though superseded in major importance by other industrial pursuits, Rhode Island's agriculture continues to be of importance in any comparative consideration of forces animating the industrial life of the state.

B. SCALE OF FARMING OPERATIONS

Present day farming in Rhode Island is conducted on a small-scale basis, her 4,327 farms reported in the Census of 1935 having an average size of but 71.1 acres per farm compared for the same year with a total of 17,487 farms in Wyoming with an average size of 1610.4 acres per farm. These States have the same percentage of all state lands in farmlands as reported by the United States Census of Agriculture in 1935.

Unlike large-scale farming regions in the West Central and West Mountains divisions of the United States, Rhode Island has always been a region of small farms, this being due largely to her physical characteristics of broken topography and variations in soil type.

Previous to the mid-years of the nineteenth century the lack of adequate facilities for communication and transportation between Rhode Island and other sections of the United States was an added

factor in limiting the size of Rhode Island farms, as the scale of farming operation was restricted principally to the demands of the small local market.

By the time the local food market had increased and facilities for easy transportation of farm products throughout the country had been developed, agriculture in Rhode Island had become superseded in financial importance by the industrial pursuits of maritime commerce and manufacturing, and her farms in consequence had further decreased in size and number as the farmers turned to these newer industrial occupations.

C. BACK-TO-THE-FARM-MOVEMENT

Although farms in Rhode Island have continued to decrease in size, a numerical increase has been under way since 1930 by reason of a notable back-to-the-farm movement.

This movement is evidenced in the 1935 United States Agricultural Census returns by the increase of 10.2% or 28,364 acres of land in farms, as well as by the increase of 30.3% or 1,005 in the number of farms, over the corresponding figures for 1930; and further indication of this movement is given by the fact that, according to the 1935 Census figures, the rural population of the State has increased by 32% showing a total increase of 5,274 persons on farms during the same period.

D. FARM OWNERSHIP AND EMPLOYMENT

The farms of Rhode Island are owned mostly by individuals, and

84.4% of the farms in the State are operated under owner-management as shown in Table 9. On the average, approximately one-third of these "owner-operated" farms are mortgaged for about one-third of the value of their lands and buildings. The Census of 1930 shows 36.5% of "owner-operated" farms as mortgaged, with an average debt for such mortgaged farms of $2,977. against an average total value of $8,960. for their lands and buildings.

The United States Census of Agriculture shows 21,751 persons living on farms in Rhode Island as of January 1, 1935, and gives a total of 7,792 persons in Rhode Island actually engaged in farm labor exclusive of housework, of which total 2,536 are classified as hired help working for wages, and 5,256 constitute family labor working without wages, the equivalent of two or more days during the first week of January 1935. This report further shows for the same period, however, that 1,508 of these total farm workers are additionally engaged for pay an average of 183 days of the year in non-agricultural occupations.

A comparison of the number of workers engaged in agricultural pursuits with workers in other industrial pursuits is given in Chart V. This chart is based on the United States Census of Occupations for 1930, which classified 9,901 gainful workers in Rhode Island as engaged in agriculture, forestry and fishing, this number representing 3.3% of all gainful workers in the State.

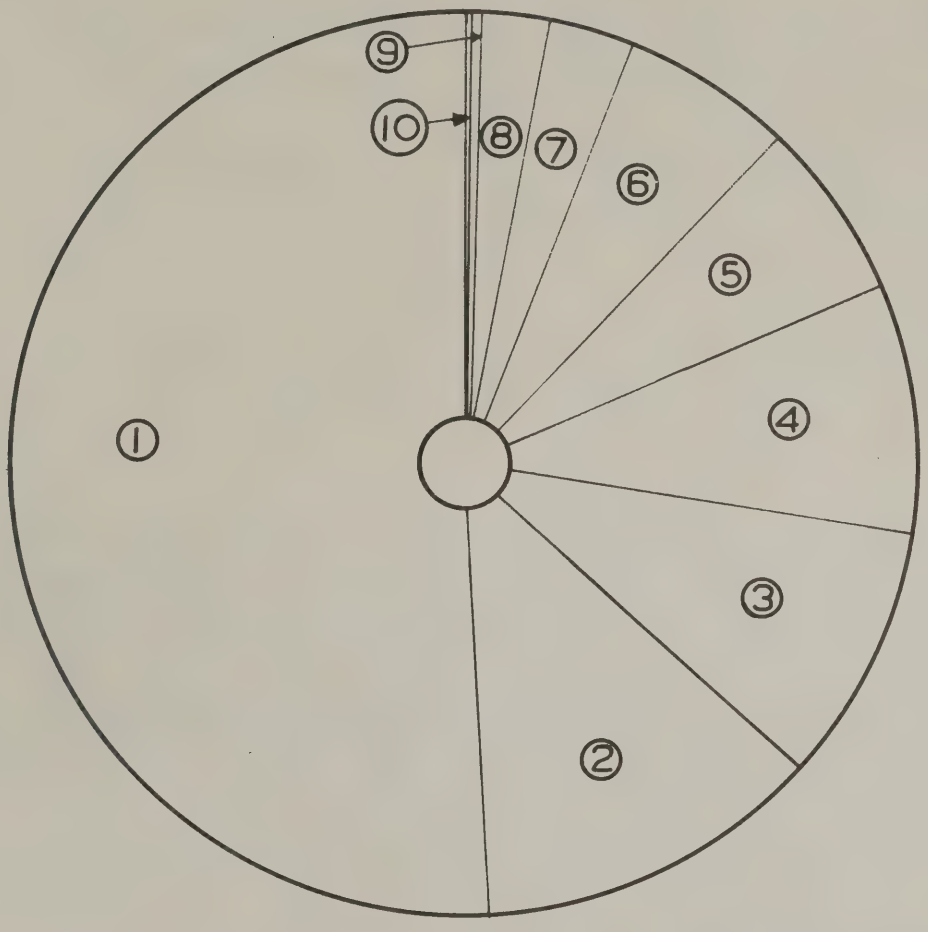
E. ANALYSIS OF FARMS BY TYPE

1. CLASSIFICATION OF FARMS BY TYPE

The classification of farms here given follows that adhered to by the United States Department of Agriculture, by which a farm

OCCUPATIONAL DISTRIBUTION OF GAINFUL WORKERS IN RHODE ISLAND

FROM STATISTICS FURNISHED BY U.S. CENSUS BUREAU
CENSUS YEAR 1930
DRAWN BY STATE PLANNING BOARD
JUNE 1937



GENERAL DIVISION OF OCCUPATIONS	NO. OF WORKERS	PERCENT OF TOTAL
1. MANUFACTURING & MECH. INDUSTRIES	151,462	51.0
2. TRADE	36,802	12.4
3. DOMESTIC & PERSONAL SERVICE	27,226	9.2
4. CLERICAL OCCUPATIONS	26,938	9.0
5. TRANSPORTATION & COMMUNICATION	19,072	6.4
6. PROFESSIONAL SERVICE	18,073	6.1
7. AGRICULTURE	8,833	3.0
8. PUBLIC SERVICE	7,461	2.5
9. FORESTRY & FISHING	1,068	0.3
10. EXTRACTION OF MINERALS	237	0.1
TOTAL	297,172	100.0
TOTAL POPULATION OF STATE	687,497	

is designated as to type on the basis of the product, or group of products, which provides 40% or more of its total source of income.

The Rhode Island farm classification is composed of nine different types as follows:

(1) General Farms, where the value of any one product is less then 40% of the total value of all farm products.

(2) Crop Specialty Farms, including grains, hay, vegetables, fruits, plants, flowers, and all other crops harvested which have been, or are to be, sold or traded.

(3) Fruit Farms, including small fruits, such as strawberries, raspberries, blackberries, cranberries, etc. as well as all tree fruits, nuts and grapes.

(4) Truck Farms, including all vegetables grown for sale.

(5) Dairy Farms, including all milk, cream, butterfat, butter, dairy cows and calves produced or raised for sale or exchange.

(6) Animal Specialty Farms, including all classes of beef cattle, sheep, hogs, wool, mohair and slaughtered animals.

(7) Poultry Farms, including chickens, ducks, geese, turkeys and chicken eggs.

(8) Self Sufficing Farms, where the value of farm products used by the operator's family is 50% or more of the total value of all farm products of the farm.

(9) Abnormal Farms, including institutions, country estates, part time farming, forest products, horse farms, livestock dealers and unclassified farms.

2. EXTENT AND DISTRIBUTION OF TYPE FARMS

A total of 4,327 farms were listed in Rhode Island by the United States Department of Agriculture in its report for 1935

with a total area of 307,725 acres in farms. A total of 3,322 farms were likewise listed for 1930 with an aggregate farm area of 279,361 acres in Rhode Island.

The distribution of the 1930 total by number and acreage of the various types of farms throughout the five counties of the State as given in Table 28, probably reflects in a general way the relative state predominance and the relative county distribution of the same types today. It shows the two normal farm types then predominating in numbers to be the dairy farms and the poultry farms, with the greater number of both such type farms located in Providence County.

Table 28

Distribution of Rhode Island Farms in Counties by Type of Farm, 1930

Type of farm	State No.	Total acres	Providence Co. No.	Providence Co. acres	Kent County No.	Kent County acres	Washington Co. No.	Washington Co. acres	Bristol Co. No.	Bristol Co. acres	Newport Co No.	Newport Co acres
General	383	32994	109	8326	69	3789	113	15872	16	501	76	4506
Crop	35	3702	13	918	--	--	11	2192	--	--	11	592
Fruit	79	8642	58	6513	6	204	8	1607	3	82	4	236
Truck	174	6245	77	2795	20	776	14	1094	16	423	47	1157
Dairy	1183	118592	441	46147	145	14532	198	30865	63	3996	336	23052
Animal	48	8887	13	889	12	2090	19	5193	--	--	4	715
Poultry	463	30313	157	8403	119	6126	127	13354	18	416	42	2014
Self Suf.	340	19928	177	10174	73	2867	62	5922	--	--	28	965
Abnormal	617	50058	295	17008	148	15902	69	10912	28	2187	77	4049
Totals	3322	279361	1340	101173	592	46286	621	87011	144	7605	625	37286

3. FARM OPERATION BY TENURE OF TYPE FARMS

The status of owner-predominance in the operation of farms by tenure is consistent in all types of farms in Rhode Island, with 84.4% of the State total of farms operating under owner-management in 1930; as shown in Tables 9 and 29.

Table 29

Rhode Island Farms by Tenure of Operator and Type of Farm, 1930

Type of farm	Total No. of farms in state	Owner management	% State	Hired management	% State	Tenant management	% State
General	383	335	10.1%	17	0.5%	31	0.9%
Crop	35	27	0.8	1	--	7	0.2
Fruit	79	74	2.2	2	0.1	3	0.1
Truck	174	147	4.4	1	--	26	0.8
Dairy	1,183	950	28.6	35	1.1	198	6.0
Animal	48	41	1.2	1	--	6	0.2
Poultry	463	410	12.3	3	0.1	50	1.5
Self suf.	340	315	9.5	--	--	25	0.8
Abnormal	617	509	15.3	39	1.2	69	2.1
Total	3,322	2808	84.4	99	3.0	415	12.6

4. VALUE OF FARM PRODUCTS ON TYPE FARMS

The "gross value of farm products sold, traded, or used by the operator's family" reported in detail for the various types of farms for 1929, as given in Table 30, is not too closely comparable with the "gross value of all farm products" reported in total for all farms for the same year as given in Tables 17 and 18, because of the variance in the number of facts included by the Census Bureau for compiling the two sets of values and because of the difficulties encountered in this first attempt of the Census Bureau to classify in detail by type of farm.

However, the breakdown of the gross value mentioned first in the preceding paragraph probably measures quite accurately the relative contribution of the different type farm groups toward the gross agricultural income of the State; it gives a preponderant importance to the dairy type farm group with a productive income of $6,183,126., and shows the poultry type farm group to be of second importance with an income of $1,001,474. The aggregate value of those two groups constitute the major part of the value of all farm products recorded in Table 30.

Table 30

Gross Value of Farm Products Sold, Traded, or Used by Operator's Family - by Type of Farm in Rhode Island, 1929

Type of farm	Crops inc. plants sold or traded	Forest products sold	Livestock products sold or traded	Livestock sold or traded and slaughtered	Farm products used by operator's family	Total all farm products as specified
General	$207,681	$20,983	$209,772	$ 59,686	$120,800	$ 618,922
Crop	102,676	1,160	13,066	2,186	8,403	127,431
Fruit	280,342	4,011	20,461	3,164	19,824	327,802
Truck	369,245	725	35,123	4,341	48,851	456,285
Dairy	330,165	40,011	4,869,233	563,271	380,446	6,183,126
Animal	5,160	920	23,436	81,377	14,422	125,815
Poultry	42,562	9,010	793,832	39,028	117,042	1,001,474
Self Suf.	12,430	4,594	27,495	6,338	108,242	159,099
Abnormal	125,526	70,968	303,374	285,950	122,762	908,580
Totals	1,475,787 (1)	152,382 (2)	6,295,732 (3)	1,045,841 (4)	940,792 (5)	9,910,534 (6)

(1) Tables 17 and 18 give a total for crops "harvested."
(2) Tables 17 and 18 give a total for forest products "cut."
(3) Tables 17 and 18 give a total for livestock products, "mixed."
(4) Directly comparable with Tables 17 and 18.
(5) Tables 17 and 18 give no comparable figure.
(6) Fairly comparable with Tables 17 and 18 when inconsistencies of sub-totals are appraised.

5. MAJOR FARM EXPENDITURES ON TYPE FARMS

Dairy type farms expended $3,156,947 and poultry type farms expended $559,583 of the State total of $5,660,258 for the three major farm operating expenditures - feed, fertilizer, and labor - on Rhode Island farms in 1929, as shown in Table 31.

Table 31

Major Farm Expenditures by Type of Farm in Rhode Island, 1929

Type of farm	Feed (1) for livestock	Fertilizer(2) all kinds	Farm labor(3) in cash	Total specified expenditures
General	177,756	32,947	128,665	339,368
Crop	12,091	12,494	22,133	46,718
Fruit	21,671	18,893	85,334	125,898
Truck	52,876	63,482	97,204	213,562
Dairy	1,984,774	128,218	1,043,955	3,156,947
Animal	30,924	1,456	20,261	52,641
Poultry	461,955	11,359	86,269	559,583
Self Suf.	42,672	4,426	4,335	51,433
Abnormal	262,555	62,921	788,632	1,114,108
Totals	3,047,274	336,196	2,276,788	5,660,258

(1) "Not raised on this farm." (3) Exclusive of housework.
(2) All fertilizers - commercial, manure, marl, lime, ground limestone.

6. LIVESTOCK - NUMBER ON TYPE FARMS

Comparison of the numbers of certain specified livestock on Rhode Island farms in 1930 shows that the greatest concentration of total livestock is on the dairy type farms, with cattle predominating and numbering 24,584 on such farms contrasted with a State total of 31,633 cattle on all farms, as given by type of farm in Table 32.

Table 32

Number of Certain Specified Livestock on Farms, 1930

Rhode Island Farms by Type

Type of farm	Horses & mules	Milk cows	Beef cattle	Other cattle	Sows & gilts	Other hogs
General	340	1,011	66	1,116	19	145
Crop	29	74	--	56	--	4
Fruit	60	81	--	73	2	17
Truck	130	191	6	96	20	170
Dairy	1,614	15,727	120	8,737	166	1,065
Animal	46	130	4	295	91	623
Poultry	226	440	41	441	12	68
Self suf.	201	326	7	357	10	157
Abnormal	524	1,191	27	1,020	98	844
Totals	3,170(1)	19,171	271	12,191	418	3,093(2)

(1) Does not include 96 colts (92 horse colts and 4 mule colts.)
(2) Does not include 1300 pigs under 3 mo. old.

7. VALUES OF FARM PROPERTY ON TYPE FARMS

Dairy type farms in Rhode Island had a total valuation in 1930 of $7,672,667 for land, $7,185,963 for buildings and $1,381,591 for implements and machinery, making a combined total valuation for such items of $16,240,221 for dairy farms as against a similarly compiled total of $37,226,118 for all farms in the State, as shown by type of farm in Table 33.

Table 33

Values of Specified Farm Property by Type of Farm in R.I., 1930

Type of farm	Total value (1) farm property as specified	Value of farm lands & buildings	Value of farm buildings	Value farm implements & machinery	Av. value per farm land & bldg.
General	$ 3,584,601	$ 3,371,384	$1,684,268	$ 213,217	$ 8,803
Crop	383,735	334,950	171,350	48,785	9,570
Fruit	1,282,884	1,199,365	544,320	83,519	15,182
Truck	1,838,727	1,662,580	822,220	176,147	9,555
Dairy	16,240,221	14,858,630	7,185,963	1,381,591	12,560
Animal	405,175	376,950	180,970	28,225	7,853
Poultry	3,099,366	2,900,979	1,801,918	198,387	6,266
Self suf.	1,814,695	1,725,670	1,027,320	89,025	5,076
Abnormal	8,576,714	8,077,241	4,475,211	499,473	12,498
Totals	37,226,118(1)	34,507,749	17,893,540	2,718,369	10,388(2)

(1) Does not include value of farm livestock. See Table 22.

(2) Average value per farm -- land and buildings.

F. PREDOMINATING FARM TYPES

Approximately 60% of the farms in Rhode Island come under the general classification of specialty farms, and the two predominating types of such farms are the dairy specialty farms and the poultry specialty farms.

These two types of farms lead all others numerically and in value of farm production; and relative to the state total of 3,322 for all farms in 1930, the group of 1,183 dairy type farms and the group of 463 poultry type farms produced respectively 62.4% and 10.1% of the state total of $9,910,534. in value for all specified farm products, as shown for 1929 in Table 30.

Of the normal farm types in Rhode Island, the general farm type ranks third in point of numbers and value of productions, as shown in Tables 29 and 30.

The specialty farms in Rhode Island engage also to a considerable extent in general farming, as shown by the variety of products produced by each of the various type farm groups, as given in Table 30.

1. DAIRY TYPE FARMS

A total value of $4,916,146. in 1929 for the total dairy products of all farms in Rhode Island, as shown in Table 17, was reported in 1930 by the United States Department of Agriculture. This is by far the highest value of any single productive agricultural activity in Rhode Island.

Dairying is also perhaps the most extensive agricultural activity in the state; as shown in the 1930 Federal Census, which reports 2,419 farms, or 72.8% of the 3,322 total Rhode Island farms

in 1930, as having cattle (mostly dairy); and as further shown in Table 30, where the values of livestock products, mostly dairy, are seen to be contributed by all the various groups of type farms. A total of 4,327 farms in Rhode Island was reported for 1935 by the United States Department of Agriculture; and a total of 3,839 farms in the state, or 88.7% of the 1935 Federal farm total, was reported by the State Division of Animal Industry as having cattle, mostly dairy, in the year 1936.

Approximately 35% of all farms in the state specialize in dairy farming, as may be observed in Table 29; and the Rhode Island group of dairy type farms had a total capital investment value of $16,240,221. in 1930, exclusive of livestock value, as shown in Table 33.

Moreover, the group of dairy type farms produces the greater part of the state's total of all farm products, as shown in Table 30, wherein it may be observed that such farms in 1929 produced approximately 22.4% of the state's total value of crops and plants; 26.3% of the forest products value; 53.9% of the value of livestock sold; and 40.4% of the value of farm products used by the farm operators' families; besides producing 77.3% of the state's total value of all livestock products -- which latter percentage includes in small part the miscellaneous other livestock products of dairy type farms with their specialty production of dairy products.

The 1935 report of the State Department of Agriculture shows that comparatively few cattle are raised in the state, and that herd replacements of cattle in Rhode Island are imported mostly from the New England states, New York, Pennsylvania, Ohio, and Wisconsin.

Records of the State Division of Animal Industry indicate that most of the 3,839 total herds of cattle in the state, reported by the Division for 1936, consist of approximately not more than eight head in a herd. Such records show that many herds in the state are reported as consisting of one or two head of cattle; that only ten herds in Rhode Island consist of more than one hundred head in a herd; and that the largest herd in the state consists of 160 head.

Of the 31,633 total cattle reported for Rhode Island by the United States Census in 1930, less than 1% are beef cattle and the remaining 99% are dairy cattle (milk cows and other, or dual-purpose, cattle), as shown in Table 32. Approximately 10% of this 31,633 total cattle in Rhode Island are of registered purebred dairy breeds, with the Holstein, Guernsey, Ayrshire, and Jersey breeds in order of numerical predominance, as shown in the following cattle tabulations for Rhode Island taken from the 1930 Federal Census report:

Table 34

Rhode Island Registered Purebred Cattle for 1920 and 1930

Year	Total No. cattle in state	Total No. registered purebreds	Purebred dairy breeds	Purebred beef breeds	Purebred dual-purpose	Grade cattle
1920	30,519	1,719	1,651	68	--	28,800
1930	31,633	3,415	3,182	42	191	28,218

Year	Farms reporting purebreds	Purebred Dairy Breeds - Registered				
		Holstein-Friesian	Guernsey	Aryshire	Jersey	All others
1920	319	542	217	494	351	47
1930	339	1,555	796*	429	388	14

* Alderney included with Guernsey.

The 1920 Federal Census presented the first detailed statement of purebred animals on farms in Rhode Island. From the cattle tabulations given above it may be observed that most of the dairy herds in Rhode Island are made up exclusively or in greatest part of grade animals, though the number of purebred dairy cattle in the State, in contrast to most kinds of livestock, shows a considerable increase in 1930 over that in 1920.

Some few farms have dairy herds consisting of a single breed of purebreds, but the practice of mixing the milk from various breeds of cows most readily provides a consistent maximum production of milk that meets the standard legal requirements, and consequently the dairy herds on nearly all Rhode Island farms are composed of mixed breeds, either mixed purebreds, or mixed grade animals, or both mixed.

The 1935 Report of the United States Department of Agriculture recorded for Rhode Island that the average daily total production for the 20,735 total cows milked in 1934 was about 158,440 quarts, and that the average daily production in 1934 for each cow milked was 7.64 quarts, compared with a similarly computed average of 4.75 quarts for the whole United States.

2. POULTRY TYPE FARMS

Poultry farming is the second greatest agricultural activity in Rhode Island. A total value in 1929 of $2,279,136. for the poultry products of all farms in the state, was reported by the United States Census in 1930, as shown in Table 17.

Approximately 15% of all farms in Rhode Island specialize in poultry farming, as may be observed in Table 29; and the Rhode Island group of poultry type farms had a total capital investment value of $1,814,695. in 1930, exclusive of livestock value, as shown in Table 33.

It is safe to say that generally all farms in the state keep some poultry. Conversely, the poultry type farms, as a group, engage also to some extent in general farming, as shown in Table 30; it will therefore be observed that the group of poultry type farms in Rhode Island produced in 1929 approximately 2.9% of the State's total value of crops and plants; 3.7% of the value of livestock sold; 5.9% of the forest products value; 12.4% of the value of farm products used by the farm operators' families; and 12.6% of the state's total value of all livestock products.

The major poultry products of Rhode Island farms are chickens and chicken eggs. In 1935 the United States Department of Agriculture reported for all farms in Rhode Island a total of 655,445 chickens raised in 1934 with a value of $589,900. and a total of 2,457,507 dozens of eggs produced in 1934 with a value of $732,337.

The principal other classes of poultry raised on Rhode Island farms, with respective numbers and values of such poultry for 1929, are as follows: turkeys raised, 12,784 - value $70,313.; ducks raised, 6,840 - value $11,104.; geese raised, 1,889 - value $5,762.; as reported by the United States Census in 1930 for all farms, as shown in Tables 12 and 17.

Records of the State Department of Agriculture for 1936 indicate that the Rhode Island Red is the breed of hen predominating in numbers on Rhode Island farms, with the Barred Rock, White Leghorn, and New Hampshire breeds also favored in large numbers. Records of the Department indicate also that the largest flock of poultry in Rhode Island consisted of approximately 5,000 adult chickens in 1936; and it is officially estimated that most of the poultry flocks in the state consist of less than 200 birds.

The United States Census of Agriculture reports that in 1934 the average annual production of eggs per hen for the whole United States was 8 dozen, whereas such average for Rhode Island was 10 dozen.

G. MARKETING OF FARM PRODUCTS

Rhode Island is primarily an importer of agricultural products. The marketed products of the farms of the state consist principally of the staple vegetables and the perishable items of milk, eggs, chickens, fruits, and garden truck.

Scientific care of livestock and intensive use of the area in cultivation have improved the return so that today Rhode Island farm products in general are of excellent quality, and the yield per unit of production is high in comparison with the United States as a whole.

Yet with the development of quicker and cheaper transportation and better refrigeration facilities, Rhode Island agricultural products have long been encountering serious competition in the local market.

1. EXTENT OF MARKET AND COMPETITION

Figures are not available to show the full extent of the agricultural consumer's market in Rhode Island. It is indicated in part, however, in Table 34 which shows, in condensed form, the Rhode Island imports of vegetables and perishable farm products for 1935, received in the greater Providence market, as reported for the same year by the State Department of Agriculture and Conservation.

Table 35

Rhode Island Imports of Specified Farm Products, 1935

Carloads Received in the Greater Providence Market

Source of imports states	Milk	Eggs	Fruits	Garden truck	Vege-tables	Total carloads imported
California	--	--	732	518	119	1,369
Florida	--	--	576	386	22	984
Maine	--	--	1	--	933	934
Vermont	845	1	1	--	3	850
New York	2	15	308	87	101	513
Massachusetts	--	2	419	1	34	456
Virginia	--	--	47	93	143	283
Texas	--	--	--	158	115	273
S. Carolina	--	--	20	127	20	167
Georgia	--	--	111	55	--	166
N. Carolina	--	--	63	47	53	163
Arizona	--	--	--	117	14	131
All Others-23	27	291	201	179	126	824
Canada	--	--	--	--	3	3
Mexico	--	--	--	2	--	2
Totals	874	309	2,479	1,770	1,686	7,118

The figures in Table 34 show a total of 7,118 carloads of farm products, mostly perishable items, imported during 1935, and show the severe competition encountered by Rhode Island farmers, whose products for the most part are marketed within the state. Hay, grain, potatoes, and apples are shown in Table 16 to be the major single crops on Rhode Island farms. No data was found for hay and grain imports, but the figures in Table 34 include imports for 1935 of 142 carloads of apples and 1,099 carloads of potatoes. Likewise the predominating livestock products of milk and eggs on Rhode Island farms were forced to compete in the local market during 1935 with imports of 874 carloads of milk and 309 carloads of eggs.

2. VALUE OF MARKET AND FARMER'S SHARE

The total value of the agricultural consumer's market in Rhode Island cannot be computed because of lack of substantiating data, but it doubtless amounts to many millions of dollars. The value alone of the milk factor in this market is computed in the following paragraph.

The State Department of Agriculture issued a weekly bulletin under date of June 15, 1937, which states that "the results of our inspections and registrations show that approximately 286,647 quarts of milk daily made up the potential supply for the whole state" for 1936. On the basis of the milk supply figure in this bulletin, and using a consumer price of 12 cents per quart, the annual value of the consumer's market for milk alone in Rhode Island for 1936 is computed to be $12,555,138.

Whatever the share of the retail value of milk the Rhode Island farmer receives, in general it evidently affords him little if any profit. This is evidenced in the bulletin referred to, which further reports the potential supply of 281,405 quarts of milk daily for the whole state for the year 1931. Thus it is seen that the daily consumption of milk in Rhode Island has increased over that in 1931 by approximately 5,242 quarts daily for 1936; and yet this bulletin shows that but 59% of the total milk supplied to the Rhode Island market originated on Rhode Island farms in 1936, as compared with 61.8% of such supply so originating in 1931. In other words, as compared with the year 1931, this bulletin shows that the potential production of milk on Rhode Island farms has dropped by 5,242 quarts daily for 1936.

Comparable data for vegetables and the perishable farm products other than milk are not available, but the imports shown in Table 34 indicate surely that the Rhode Island farmers are furnishing a much smaller percentage of these items to the local market than is the case with milk.

3. PROBLEM IN MARKETING SITUATION

In order to be a successful competitor in the eastern market, the western producer of agricultural products must be large and well organized, and must attractively offer only his best products in the eastern market in order to obtain a price high enough to insure a profitable return. These basic conditions have forced distant producers to organize and to increase efficiency in marketing method.

The Rhode Island farmer, by reason of his nearness to the local state market, has a time-and-transport cost advantage over the distant agricultural producer. But Rhode Island farmers, with some exceptions, are not as well organized as are their western competitors to offer their products by the modern marketing method. Such method requires efficient sales agencies, which offer farm products in a dependable volume from a single source, and in a standard pack that is marked by grade and brand which insures uniform quality.

As compared with efficiency of production, the knowledge or practice of profitable marketing of agricultural products lags far behind in Rhode Island. From the viewpoint of a farm as a profitable unit of the agricultural industry, good management would mean that efficiency of production is gaged with respect to quality specifications and quantity demands to dovetail with market conditions; and good management would thus combine the production and marketing of farm products and so insure a consistent profit. In the division of his labor between these two broad functions of production and marketing, it is not infrequent practice for the Rhode Island farmer to have efficient production with protective legislation and yet to lose the benefits of such production through unprofitable marketing. The problem in general appears to be one of management. The general solution may be cooperative organization.

One encounters a wealth of opinion and theory, and much legislation, on the subject of marketing farm products. On this subject, however, there is available little comparable statistical data, and none over an extended period, from which to draw forth

definite and incontrovertible facts. Data are lacking on which to base reliable explanations of, and constructive remedial suggestions for, the seeming paradox within the agricultural industry in Rhode Island, arising from a combination of efficient production, government aid, protective legislation, increase in market demand, and decrease in potential production, as in the case of milk.

Speculative comment on this subject might be interesting but would be outside the province of this factual report.

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